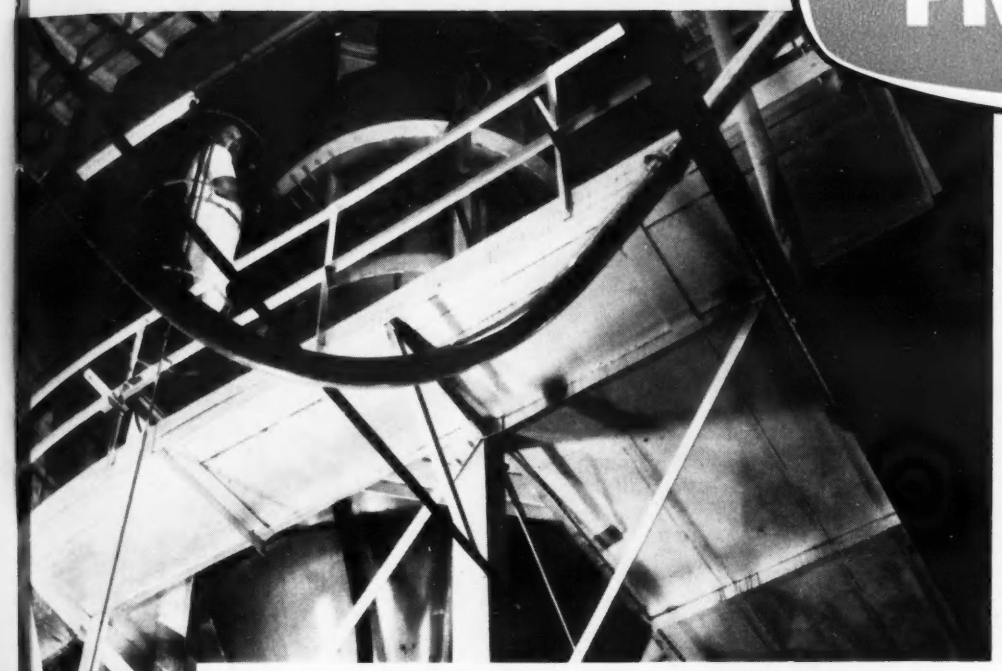
JUNE 1960

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

Humane slaughter roundup
as deadline approaches 29

Simplified automatic CIP 36

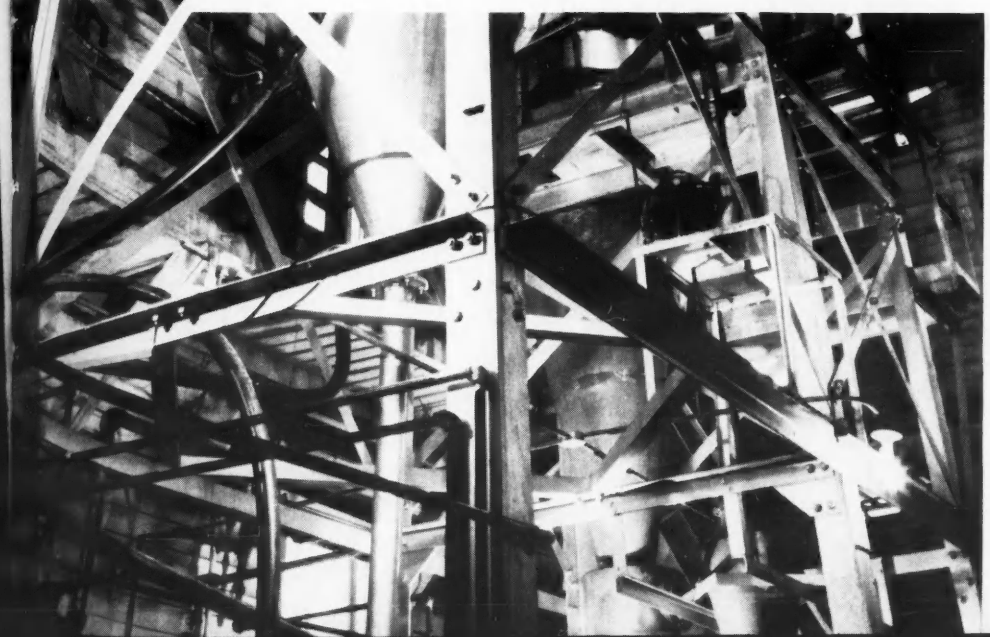
FOOD PROCESSING®



Sheffield solves problem of drying hygroscopic, heat-sensitive products

Advance Spray Drying

page 32



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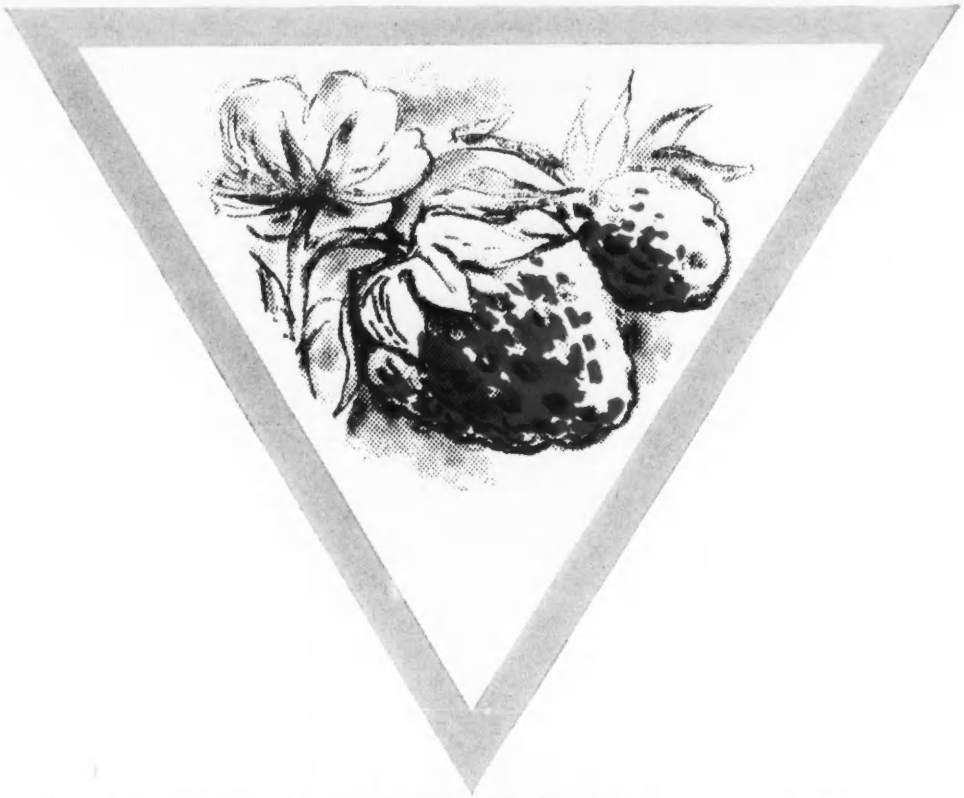

STRAWBERRY BY NORDA COMES RIGHT TO THE POINT

Nothing dull about this strawberry! There's something great about whatever it flavors! That "something" is what Norda calls "natural dimension." It's the way a flavor is made to fill out, just as Nature intended. Not too thin. Never too fat and overpowering. One point is certain: you can always rely on Norda.

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that's interesting

Campus recruiters effective, BUT . . .

While college placement officers generally feel that campus recruiters effectively represent their companies, a survey of 139 placement officers by the American Management Assn. produced the

following suggestions: (1) recruiters should be less general, more specific about the jobs. (2) they should spend more time discussing candidates' interests and (3) they should tell students what the beginning jobs will be like so the students won't feel they've been "railroaded" when they are assigned menial tasks.

Modern medicine-man

New book, FOLK MEDICINE, by Dr. D. C. Jarvis, a practicing physician, states that protein is the cause of infection, recommends a diet of apple cider, vinegar, honey, kelp, iodine, castor oil and some 53 varieties of Vermont wild greens.

Among diseases and disorders of humans which the author claims may be cured by the honey and/or apple cider-vinegar formulas are migraine headaches, infertility, ringworm, hay fever, obesity, varicose veins (apply externally), hangovers and bedwetting. In animals, the formulas are said to cure mastitis and breeding difficulties in cattle and to increase by four times the hunting ability of bird dogs.

Mass feeder's dilemma: SRO population

In another 700 years, according to Dr. James F. Bonner of the California Institute of Technology, the earth will have a "standing room only" population if the present rate of growth continues. Actually, he says, the population will probably level off at the 7½ million or 10 million level.

To feed such an expanded population, though, Dr. Bonner said, it will be necessary to (1) feed less plant foods to animals because so little of this food's value is returned as meat, (2) breed plants — like perhaps a high edible fat content sugar beet — that are rich in dietary requirements, (3) irrigate more dry areas for cultivation and (4) develop practical means of harvesting plants grown in the ocean.

Coffee with foam on the side

Scott Paper Co. has come out with an all-plastic disposable cup for coffee vending machines that offers users a dual insulation feature. The

cup is made of two plies of impact polystyrene. Inner ply consists of a porcelain-smooth white liner; foamed outer ply provides insulation to keep coffee hot, yet keep cup cool enough to handle.

Since cup is impermeable to moisture, unsightly vapor rings on desk tops and other surfaces are eliminated.

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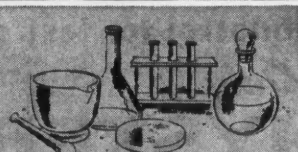

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PROTEIN TECHNOLOGY THROUGH CONTINUING RESEARCH IN MILK AND MILK DERIVATIVES

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over the editor's shoulder

Can we afford to wait?

The question of waiting refers to the need for developing a more rational approach to legislation on the cancer clause in food additives legislation.

The opinion of the food industry leaders seems to be we must wait. Their primary concern is to keep the issues out of the public's mind so that consumers can continue to purchase foods without fear.

This is tantamount to conceding defeat at the hands of the faddists who sway legislators . . . unless countermeasures are systematically undertaken.

Thus far it would appear that countermeasures being taken need more support.
It would appear that the battle for progress in food technology will turn out to be a long campaign for an informed public.

Since the food industry as an industry is reluctant to undertake this essential program, it is important that the technical men in the industry call on their professional societies to be *prominently* active in this program.

We can't afford to wait.

Harold P. Willey

Editor

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

JUNE 1960
Vol. 21 NO. 6

FOOD PROCESSING

CIRCULATION OVER 39,000

Highlights

29 Deadline Imminent for Humane Slaughtering
An up-to-date guide to approved methods and equipment — Frank Bonem, Associate Editor

32 Advance Spray-Drying Techniques
Sheffield Chemical solves problem of drying hygroscopic, heat-sensitive products — Howard P. Milleville, Editor

34 Foam-Mat Drying for Instant Dehydrated Foods
Progress report indicates more the fourfold increase in drying rate — FP Staff

36 Automated CIP Improves Product Quality
Cuts cleaning and waste disposal costs and replaces unskilled janitor labor with technicians — C. R. Johnson, Plant Manager, Baker Laboratories, Inc.

53 Form Multipack Can Carrier From Preformed Roll
Low-cost unit, applied at production line speeds, offers full product visibility — Norb Leinen, Associate Editor

Also Featured

16 Time Extension for 35 Direct, Indirect Additives

44 Longer Storage Life for Spices

57 Polypropylene Film Combines Characteristics of Cellophane, Polyethylene

61 Bottle Cap is Ooze-Free Without Liner

63 FDA Approves 41 Packaging Substances

66 Uses 1½ Miles of Chain Conveyor to Modernize Dairy-Truck Fleet Loading

73 Wine 'Flows' into Storage Fast Using Clamp Equipped Lift Truck

78 Practical Road-Rail-Ship Containerization

81 Controls CO_2 Concentration in Immobilization Tunnel to 1%

87 How to Set Up a Quality Control Lab

92 Combines Liquid-To-Solids Blending With Vacuum Drying

95 Unloader-Transfer Unit Moves Out of Way for Manual Unloading

98 Pulseless Pumping Without Foaming, Oxidizing

105 Longer Life Justifies Extra Cost of SS Condenser Tubing

EDITORIAL SECTIONS

Ingredients 44
Packaging 53
Material Handling 66
Transportation 78
Instrumentation 81
Quality Control 87
Processing 92
Sanitation & Maintenance 105

DEPARTMENTS

Products & Packages 8
Association News 10
Food Regulations 11
New Technical Literature 115
Advertisers Index 121

SPECIAL READER SERVICE

• When you want more information, see Reader Service Slip .....Opp. 123
• If you want to subscribe to this magazine, see reader qualification form .....Opp. 124

STEPHENS-ADAMSON

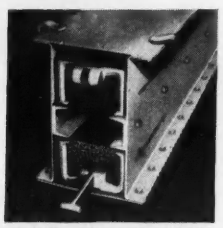
BELT CONVEYOR SYSTEM saves leading food processor up to $90,000 in year's operation

"World's Longest Grain Belt Conveyor," a half-mile STEPHENS-ADAMSON Belt Conveyor System at the A. E. Staley Mfg. Co., Decatur, Illinois, saved its owner nearly $90,000.00 in its first year of operation.

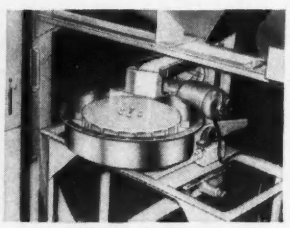
The conveyor system moves up to 224 tons of corn hourly — 192,000 bushels a day — from below the 2 million bushel capacity terminal elevator to the top of the processing plant holding elevator a half mile away.

Besides speeding corn handling to an equivalent of 100 grain cars per day, the installation provides a transfer system with better control, assures cleanliness of the corn, and eliminates spillage. Reduced handling costs per ton have resulted in considerable savings in over-all operating expenses.

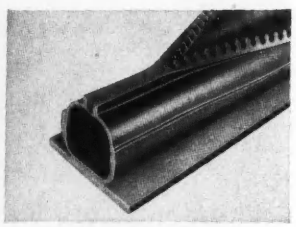
S-A ENGINEERED CONVEYOR PRODUCTS FOR FOOD HANDLING SYSTEMS



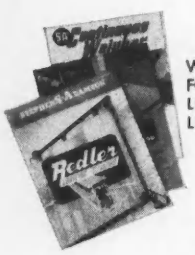
S-A REDLER CONVEYOR-ELEVATORS BULLETIN 358



S-A CONTINUOUS WEIGHER BULLETIN 958



S-A "ZIPPER" CLOSED-BELT CONVEYOR-ELEVATOR BULLETIN 349



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FOOD PROCESSING

(Food Processing Preview)

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The case of the dry milk that tamed the tiger in a baby food

The tiger in question was the heamolytic spore, a vindictive troublemaker quite innocuous in grownups but given to diabolic ways in sensitive siblings.

A manufacturer of baby foods would have none of it.

Quite rightly he insisted his baby foods be as baby-*safe* as they were tasty. Give us a whole dry milk, he said, with the heamolytics eliminated.

A tall order, indeed, because heamolytics are as much a part of dairy foods as protein.

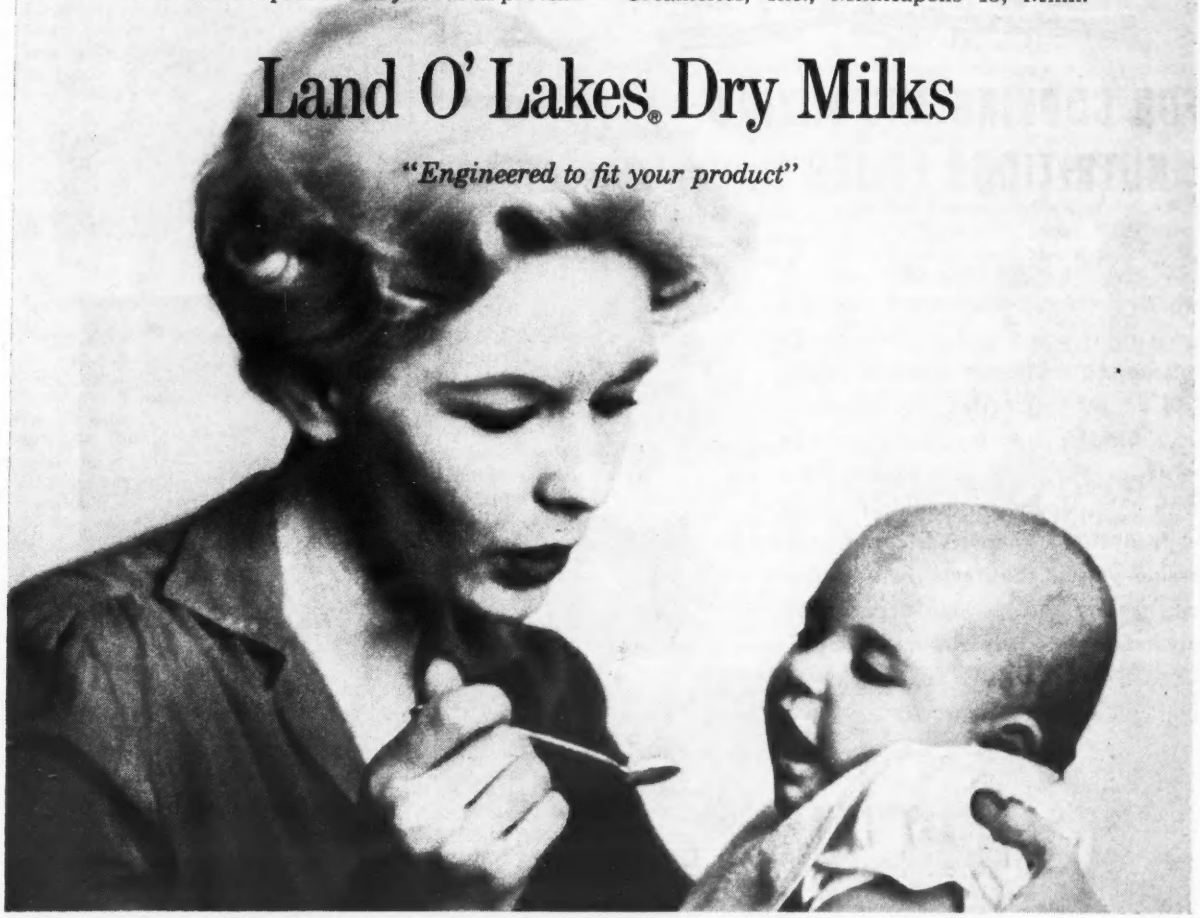
Fortunately, Land O'Lakes creative chemists have a refreshing knack for cutting tall orders down to size. They "engineered" a completely new *kind* of dry milk that met this very special need.

Result: These same tasty baby foods are now heamolytic-free, safe as mother love.

You, too, may process a product that can benefit from one or more of our dry milks. If we haven't the precise one you need, we will create it. Write us. Land O'Lakes Creameries, Inc., Minneapolis 13, Minn.

Land O' Lakes® Dry Milks

"Engineered to fit your product"



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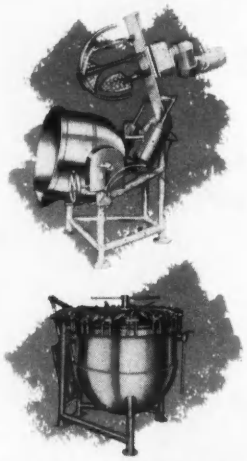
There's nothing you can't process in a **GROEN** steam jacketed kettle!

FOR COOKING AND MIXING NUTRITIOUS FOODS faster...easier

Beef stew or baby food, chop suey or frozen dinners—wherever controlled cooking is combined with thorough mixing, Groen steam jacketed kettles will do the job better. Instantaneous heat transfer cuts processing time as much as 50%. The new Groen plant with its expanded production facilities is producing a greater variety of processing vessels than ever before. Our engineering and research departments are available to help you in developing custom equipment. Write for complete information on our standard equipment and special services.



Groen products include a complete line of tanks, coils, vacuum kettles, reaction kettles, revolving pans, tubular heat exchangers and pilot plant processing units.

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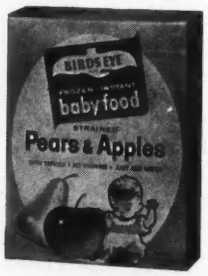
PRODUCTS AND PACKAGES

'Shrink-on' multipack . . .

. . . still in development stage, provides all the strength of bulkier multipacks for canned food items, yet is lighter, cheaper and more attractive. Using shrinkable overwrap made of Du Pont's "Alathon" polyethylene, the unusual multipack idea gives these advantages: 1) complete transparency — allowing container labels to replace costly printing; 2) savings up to 50 per cent, based on reduced cost of materials and printing economies; 3) ease of handling — package remains rigid as containers are "torn" from pack one-by-one. For frozen foods, extra advantage is that package will not disintegrate or tear simply because of presence of excess moisture. Wrapping itself is done by standard polyethylene overwrap machine, with slight modifications, after which package is conveyed through a 300 F shrink tunnel.



No 'babying' needed . . .

. . . for new line of General Foods Birds Eye frozen baby foods, which can be held up to one month in the non-frozen section of refrigerator. Unique dry freezing process produces "free-flowing crystals" which require no preliminary thawing, are prepared for serving by placing in dish and adding hot (or, for fruits, cool) water, and stirring. Now in market test, line includes 17 items in the vegetable, soup, fruit and dinner classifications.

Glammer-bergers . . .

. . . top-quality Swift's Premium Beef Burgers now come in individually sealed transparent zip-open jackets that are convenient, sanitary and attractive. Patties slip from their "jackets" into the pan without pre-thawing. There is no problem of separating frozen patties, and no problem of rewrapping or packing those that are to remain in the freezer.

Supplier: Continental Can Company, Boxboard and Folding Carton Division, 100 E. 42nd St., New York 17, N.Y. 7423 on Reader Service Slip.

Boil-in-bag line redesign . . .

. . . includes all 14 products in Seabrook Farms' line of "miracle pack" boil-in-bag frozen foods. Earlier packages showed a drawing of a country kitchen, did not distinguish individual products except by name. New carton features colored photograph of the product, attractively served. Items in line include Chicken Cacciatore, Beef Goulash with Noodles, Baked Haddock Fillet, Beef with Onions in Wine Sauce, Macaroni with Beef, Macaroni and Cheese, Delmonico Potatoes, Potatoes and Peas in Cream Sauce, Creamed Spinach, Chopped Broccoli au Gratin, Peas in Onion Sauce, Baby Lima Beans in Cheese Sauce, Asparagus Cuts and Tips Hollandaise and Creole Succotash.

Supplier: Continental Can Company, Boxboard and Folding Carton Division, 100 E. 42nd St., New York 17, N. Y.

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'Boil-in' fish dishes . . .

. . . fillets of codfish in shrimp sauce and fillets of cod in lobster sauce now are being marketed to restaurants, drive-ins, diners and various institutional feeding establishments by Coldwater Seafood Corp., 405 Lexington Ave., New York 17 — exclusive domestic representative of Icelandic Freezing Plants Corp. Each package contains two portions individually wrapped in a ready-to-boil Mylar pouch, and ready to serve in 12 min.

From inner bag out, through spout . . .

. . . new bag-in-box concept being used by The Borden Company for Starlac dry milk and Instant Whipped Potatoes has handy pour spout opening into an inner Alcoa foil-laminated bag that is tacked to inside of box. New approach to the hermetically sealed carton is excellent for such hygroscopic products as gelatin, pudding desserts, dehydrated soups, dry cereals, pie crust mixes, cake mixes, dehydrated potato products, dehydrated milk and instant coffee.

Supplier: Interstate Folding Box Co., Middletown, Ohio.

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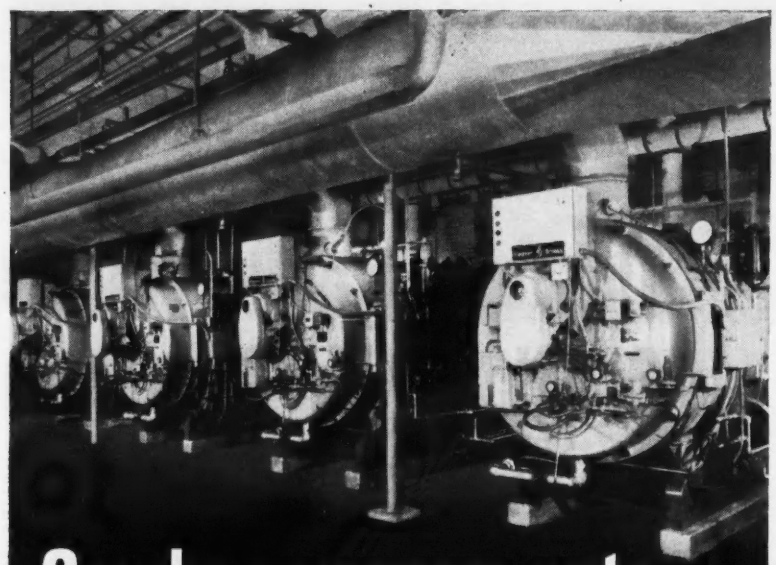
'Boil-in-blanket' . . .

. . . packaging concept for wieners, proposed by Minnesota Mining and Manufacturing Company, employs heat-sealable "Scotchpak" brand polyester film. Entire roll of wieners can be boiled together, or each can be cooked in individual package simply by separating the film at its seams.



Candy company cuts steam costs in half!

At Edgar P. Lewis & Sons, Inc., Malden, Mass., four Cleaver-Brooks packaged boilers assure a constant supply of steam at constant pressure — result is higher candy quality at lower cost

This leading New England confectioner formerly purchased its steam at a cost of $80,000 a year. Mr. Frank Reis, plant engineer, reports that since installation of four Cleaver-Brooks combination gas/oil boilers, operating costs have been reduced by half. What's more, Mr. Reis points out that having a truly dependable source of steam at constant pressure has improved the quality of his company's candies.

Steam is used for both heating and processing. Two of the CB boilers are high pressure—steam produced at 120 lbs. is piped to kettles where the candy is cooked. A pair of low pressure CB boilers operate 24 hours a day furnishing heat for the five plant buildings. Low pressure steam is also used in candy drying operations.

Day-in and day-out dependability is one feature that makes Cleaver-Brooks packaged boilers tops with food processors. Cleanliness, lower installation and operating costs, lasting high efficiency and free starting service are other big plus factors. For complete information on CB boilers (130 models, 15 to 600 hp, gas, oil or gas/oil fired) call your representative or write Cleaver-Brooks Company, Dept. P, 357 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver Brooks
ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

SWEET SAVINGS — Jelly strings, marshmallow eggs, chocolate peanuts are just a few of the quality candies made by Edgar P. Lewis & Sons, Inc. Battery of four Cleaver-Brooks boilers keeps steam costs down . . . keeps candy quality up.

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AND NOW...

The Technical Breakthrough Sought By The Baking Industry For Over 28 Years

Durkee Discovers the Method For Producing a *Fluid* Emulsifier Shortening

Since emulsifiers were first introduced to the baking industry over 28 years ago, product development and production men looked to the day when a simple turn of a valve would release a fluid emulsifier shortening.

For if this could be accomplished, it would mark the baking industry's most important development . . . an emulsifier shortening which could be pumped, poured or metered . . . in other words, a prime requirement for fully automated bakery operation.

But the feat remained unaccomplished. In trial after trial, fluid shortenings failed at the introduction of emulsifiers.

Then, several years ago, a Durkee scientist noticed an unusual quality in two disassociated compounds under development . . . an unforeseen compatibility between an experimental non-hydrogenated oil and a unique emulsifier being readied for introduction to the baking industry. When combined under strict environmental conditions, *the resulting product remained fluid!*

Here was the breakthrough, but it proved only the beginning. Durkee's Technical Staff put month after month into refining, adapting and altering formulations. Then, testing; in research lab, pilot plant, baking lab, and testing in accredited outside facilities as required for FDA approval.

Result? A fully approved product with commercial practicability. Even more. Durkee's emulsifier, held in microscopic suspension throughout the fluid, is so functional that it reacts virtually immediately in a batter, holding more oil and water in emulsion than ever before possible. In addition, more air is entrapped in the batter.

To the baker, this means lighter, more tender cakes. It means more cakes per batch, or bigger cakes. It means cakes that retain fresh-baked taste and texture for twice as long as before. It means the end of scooping, scraping or shoveling shortening. It means at long last, a baker can turn a valve and measure an incomparable shortening. And all these mean profit.

Durkee has announced this modern miracle to an appreciative baking industry. It's called Fluid Flex Shortening, and its development is another outstanding product of the research continually in progress in Durkee's Technical Laboratories. Here is where we may be able to help you most whenever your product or process warrants further attention. We'd be glad to help. Just 'phone us or write.

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association news

Dr. James W. Evans, vice president of research, American Maize Products Co., Roby, Ind., has been named president-elect of the **American Association of Cereal Chemists.**

At the recently concluded annual meeting of the **Institute of Food Technologists** in San Francisco, **Dr. Harold W. Schultz,** head of the Department of Food and Dairy Technology at Oregon State College, Corvallis, was installed as president-elect.

Also at the IFT Meeting, these awards were made: International Award to **Dr. J. R. Vickery,** chief of the Division of Food Preservation, Australian Commonwealth Scientific and Industrial Research Organization, for his outstanding efforts in promoting international exchange of ideas in the food technology field; Food Technology Industrial Achievement Award to **American Meat Institute Foundation** and **Merck & Co., Inc.,** for development of a process to control fermentation of various meat products.

Dr. Roy C. Newton, recently retired research vice president at Swift & Co., has been named to the newly created post of co-ordinator for utilization research for USDA. He will be responsible for continuing review of all utilization research and development work.

Sugar Research Foundation, Inc., has elected **Dr. John L. Hickson** vice president and scientific director. He succeeds Dr. Henry B. Hass, who has resigned as Foundation president, but who will continue to serve as a consultant.

Newly elected officers of the **National Assn. of Frozen Food Packers** are **William F. Edwards,** Pasco Packing Co., Dade City, Fla., president; **James S. Lawless,** Frosted Fruit Products, Los Angeles, first vice president, and **Norman L. Waggoner,** Olney & Carpenter, Inc., Wolcott, N.Y., second vice president.

food regulations

Subtly critical of Flemming's administration of the Delaney cancer clause, the . . .

White House Report stresses need for most informed advisors

The report which nine scientists and two consultants* selected by Dr. Kistiakowsky, the President's Special Assistant for Science and Technology, made to President Eisenhower was released last month. This is the report which the President requested after powerful agricultural groups accused HEW Secretary Flemming of irresponsible administration in the cranberry scare last Thanksgiving.

Recommendations of the report were couched in qualifying terminology typical of scientists striving to be as objective as possible.

Dealing almost entirely with problems in the administration of the Delaney cancer clause it suggests specific areas of research on the cause and development of cancer.

No drastic changes were recommended; in fact the Delaney cancer clause is endorsed. But the report stressed that in its administration of this clause the FDA ". . . must employ the rule of reason based on scientific judgment in order to carry out the intent of Congress to protect the public from possibility of increasing cancer risks through the diet."

The report further emphasized that ". . . if the (Delaney) clause is to be workable, it is essential that this discretion be based on the most informed and expert scientific advice available. . ."

"Accordingly, the following recommendations are made:

"1. That the Secretary of Health, Education and Welfare appoint a board advisory to him to assist in the evaluation of scientific evidence on the basis of which decisions have to be made prohibiting or permitting the use of certain possibly carcinogenic compounds.

"The advisory board should be composed of scientists from the National Cancer Institute, the Food and Drug Administration, the US Department of Agriculture, and the scientists outside of Government from a panel nominated by the National Academy of Sciences.

"It would be the function of the board to weigh evidence and to make recommendations to the Secretary of the Department of Health, Education and Welfare on the basis of available scientific data, both on applications for approval of new food additives and in all cases where the withdrawal of a prior approval or sanction is under consideration. The board would consider among other matters:

"(a) whether or not the tests for carcinogenicity are appropriate and reasonable,

"(b) whether the substance is or is not in reality carcinogenic as determined histopathologically or by other criteria,

"(c) whether addition of the substance to agricultural pro-

*Dr. Detlev W. Bronk (Committee Chairman) President, Rockefeller Institute and President, National Academy of Sciences; Dr. Robert F. Loeb (Committee Vice Chairman) Bard Professor of Medicine, Columbia University — on leave; Dr. Edwin B. Astwood, Professor of Medicine, Tufts University School of Medicine, New England Center Hospital; Dr. Alfred Gellhorn, Director of Institute of Cancer Research and Professor of Medicine, Columbia University; Dr. J. George Harrar, Vice President, The Rockefeller Foundation; Dr. Harold C. Hodge, Professor of Pharmacology and Toxicology, University of Rochester; Dr. James G. Horsfall, Director, The Connecticut Agricultural Experiment Station; Dr. C. N. Hugh Long, Sterling Professor of Physiology, Yale University; Dr. C. Chester Stock, Scientific Director, Sloan-Kettering Institute for Cancer Research; Mr. Charles S. Rhyne, Consultant, Rhyne & Rhyne, Washington, D. C.; Dr. Frederic Holtzberg, Technical Assistant, The President's Science Advisory Committee, The White House.

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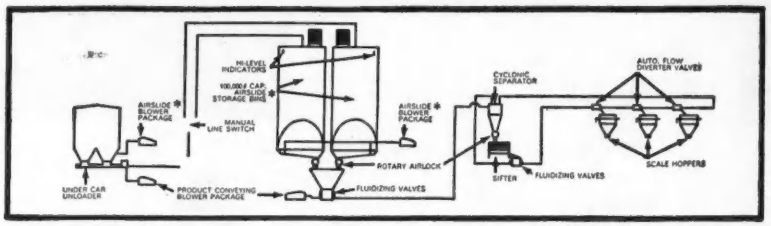

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Down payment	*7,000.00*
	$30,000.00
36 Month carrying charge	*$ 4,500.00*
Total Finance	*$34,500.00*
Average monthly payment	*$ 958.00*
Product usage	*1000 CWT/per week*
Bulk Savings	*$0.42 per CWT*
Total savings per month	*$ 1,820.00*
Total savings 36 months	*$65,520.00*
Cost of system per month	*$ 958.00*
Cash Saving with system per month	*$ 1,820.00*
Net Saving per month	*$ 862.00*

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View shows a typical installation of Tri-Clover sanitary fittings and valves serving a modern orange concentrate plant in Florida.

Photo courtesy Evans Properties, Inc.

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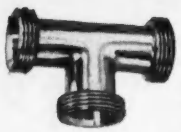
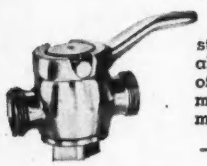
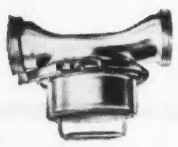


Tri-Clover stainless steel sanitary fitting with bevel seat construction: "ACME" sanitary threads.

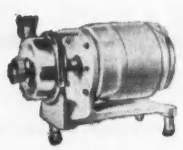
Tri-Clover Tri-Clamp fittings offer quick easy assembly and disassembly: long trouble-free fitting life.



Tri-Clover stainless steel valves are available in a full range of types and sizes to meet every requirement.



Tri-Clover full-flow magnetic traps employ an Alnico magnet to assure maximum removal of tramp metal.



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ducts would result in a concentration of the substance above the natural background level of such substance,

"(d) what assay techniques are appropriate to determine whether a specific carcinogen is present in food.

"It would also be the function of this board to review from time to time its recommendations and to modify them in the light of new scientific knowledge. Further, the board would assume the responsibility of recommending to the Secretary of Health, Education and Welfare specific research problems to be undertaken to provide necessary scientific data.

"2. If existing legislation does not permit the Secretary of Health, Education and Welfare to exercise discretion consistent with recommendations of this report, it is recommended that appropriate modifications in the law be sought.

"3. Because of the limited scientific information available relevant to the effects of possible carcinogenic food additives, it is recommended that:

"(a) Proportionately greater emphasis be placed by Government agencies on the study of representative carcinogens in a variety of animal species in an attempt to define dose-response relations. It must be recognized from the very nature of such research that definitive answers useful in extrapolation to man may not be expected for many years to come. The applicability of such research to the problems discussed in this report will be furthered by studies carried out on large groups of animals.

"(b) Studies be increased on the possible carcinogenic action of substances to which numbers of individuals have been regularly exposed and that these studies be related to the incidence of cancer in the exposed individuals. Retrospective studies should also be made of patients who have received a variety of chemical compounds, in the course of treatment of disease, which are subsequently suspected of being carcinogenic.

"4. Research be expanded also by the Department of

Agriculture, by the State Agricultural Experiment Stations, and by industry to discover additional safe and effective materials for the production and processing of foods."

Flemming's maneuvers anticipated White House Report

In the final day of House Committee hearings on the color additive bills, HEW Secretary Flemming opposed any change in the Delaney cancer clause other than the proposal he made in his testimony last January.

At that time he suggested amending the Delaney clause to provide that additives used in animal feeds which leave no residue either in the animal after slaughter or in any food product obtained from the living animal be exempt.

Secretary Flemming also discussed two points in anticipation of the first two recommendations of the White House Report (see preceding news item), to which he, of course, had advance access since the report was "concurred in" by his department.

By disclosing that he already had established an "advisory board" of scientists to advise him on specific food additive problems, he jumped the gun on the major recommendation of the White House Report.

The panel set up by Flemming is chairmanned by FDA's Dr. Lehman, and includes as its permanent members HEW scientists, that is, scientists from FDA and the National Cancer Institute. Outside scientists are appointed to the panel on a temporary basis.

Secretary Flemming also argued that the present cancer clause does allow for exercise of all the judgment that can safely be exercised on the basis of our present knowledge. The White House Report recommended that modification of this clause be made (see preceding news item) if it did not permit the Secretary to exercise discretion consistent with its other recommendations.

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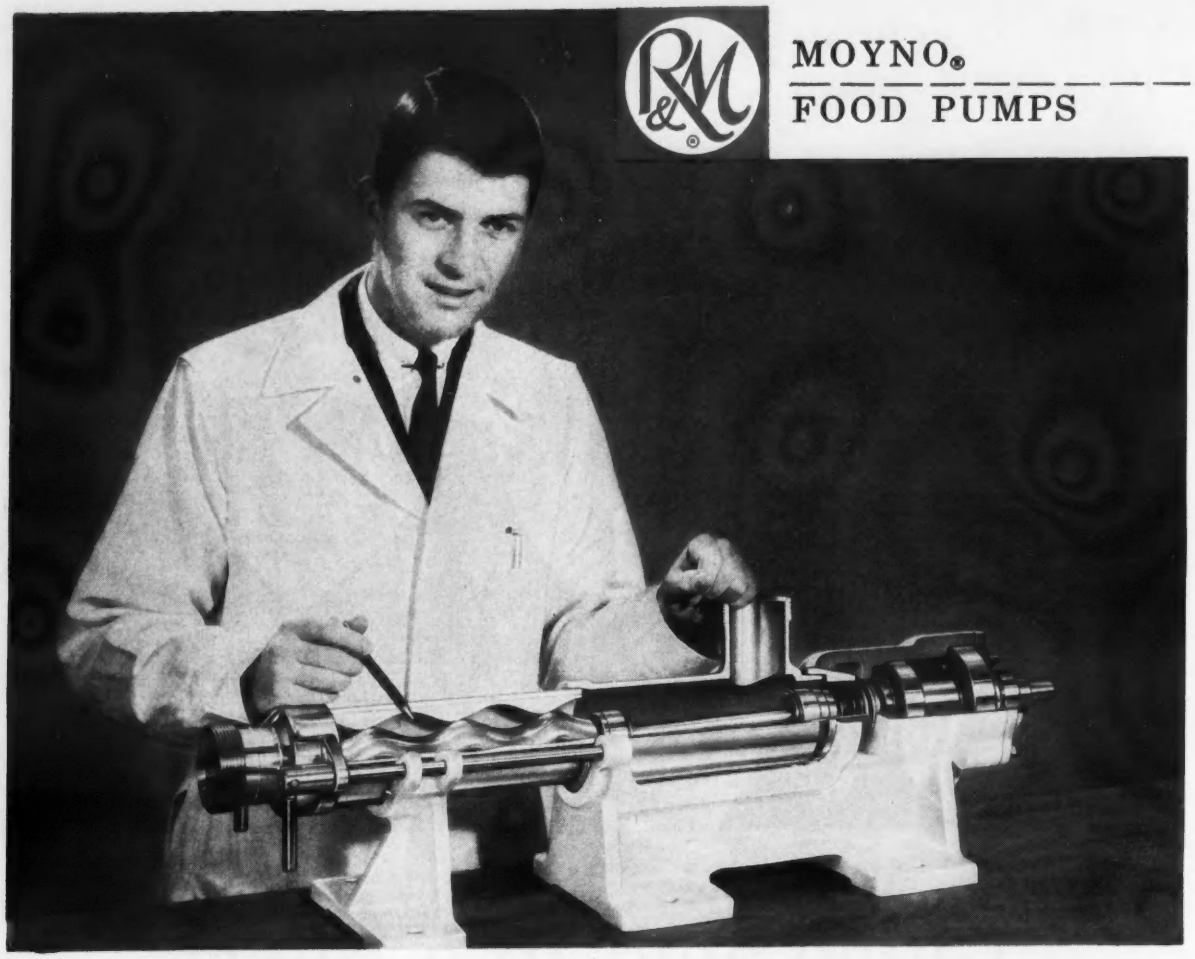

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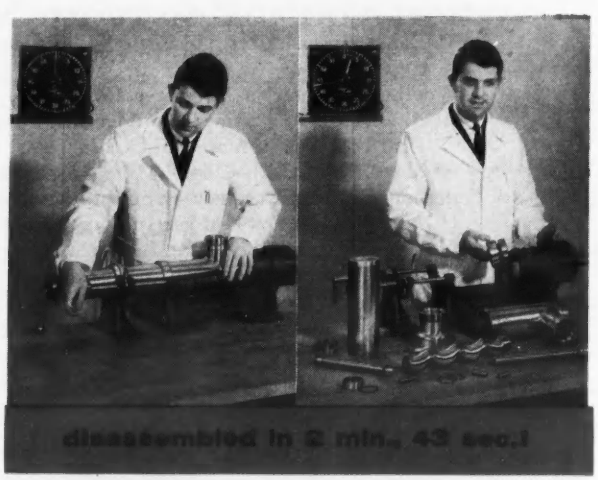

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food regulations

FDA accepts new method for guaranteeing safety of non-intentional additives

Considerable significance is attached to FDA's recent approval of the food additive polypropylene used in container or equipment material.

In this first food container approval FDA has set safety by the specifications (composition) route rather than by the actual amount of the chemical in the food.

It is expected that this approach will be used in most container cases, instead of setting a tolerance for a chemical that migrates.

If the specifications set forth are met, any chemical that might incidentally extract (migrate) is considered safe.

The original petition for approval was submitted by Hercules Powder Company. Specifications and analytical methods are described in the Federal Register for April 16.

12 additive petitions propose definite regulations

Latest petitions filed under the food additives amendment propose the following regulations:

A tolerance for polyoxyethylene (20) sorbitan monostearate to impart greater opacity to sugar-type confection coatings, where total weight of additive does not exceed 0.20 percent of the weight of finished sugar coating. (Atlas Powder Company, Wilmington, Delaware.)

Provision for use of acetone-hydrogen peroxide mixtures as flour-maturing or bleaching agents: to establish a tolerance of 100 parts per million (0.01 percent) of hydrogen peroxide equivalents

(*Continued on page 17*)

For more information on product at right, circle 7432 . . . see information request blank opposite last page.

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Extension Date for 35 Direct, Indirect Additives

FDA stayed effective date of Additives Law to March 6, 1961 for the following direct and indirect additives when used under the conditions specified. Included are 17 direct additives which are used in food or in the processing or growing of food. There are also 18 indirect additives used in food packaging.

DIRECT ADDITIVES

Product	Limits	Specified Uses or Restrictions
Carbon monoxide	Available data indicates no residue in foods ready to eat.	As an incidental constituent of inert or flue gas produced by the combustion of natural gas and used to displace or remove oxygen in the processing and packaging of nonstandardized foods
Charcoal, nonactive, produced by retort method to conform with requirements of U.S.P.X.		In foods, according to good manufacturing processes
Ethylene dichloride	0.01 per cent	Residue in production of spice oleoresins
Ethylene oxide		In dried fruit as a residue from use as a fumigant, applied at rate of 0.4 milliliter per pound of dried fruit
Ethylene oxide	50 parts per million	In ground spices as a residue from use as a fumigant
Glyceryl abietate (ester gum)	100 ppm	In citrus-flavored beverages
Lecithin, hydroxylated		Not to exceed 0.5 per cent as an emulsifier in foods, excluding standardized foods
Metaldehyde	Zero residue on strawberries at time of harvest	One pound per acre as a spray or dust on strawberries, applied not less than 14 days before harvest, for control of slugs and snails
Methylethylcellulose	3.0 percent	In vegetable fat whipped topping
Monoglyceride citrate	200 ppm	As an antioxidant in fats
Mono- and diglycerides prepared from oleice acid in accordance with extension granted in this order		As an emulsifier in foods
Oleic acid prepared from edible fats and oils, free from chickedema factor		In foods and in the manufacture of food components
Polysorbate 80 (polyoxyethylene (20) sorbitan monooleate)		As an emulsifier or solubulizer in vitamin preparations, providing for not more than 280 milligrams daily for children and not more than 500 milligrams daily for adults
Polysorbate 80 (polyoxyethylene 2% sorbitan mononleate)	0.26 ppm	In fluid milk, from its use as a dispersing agent for Vitamin D concentrate
Polyvinylpyrrolidone	170 ppm	In vinegar as a residue from precipitating undersirable constituents (tannins)
Polyvinylpyrrolidone	400 ppm	In wine as a residue from precipitating undersirable constituents (tannins)
Stearic acid, prepared from edible fats and oils, and free from chickedema factor		In foods and in the manufacture of food components

INDIRECT ADDITIVES

Product	Specified Uses or Restrictions
Castor oil phthalate	Not to exceed 0.26 per cent in cellophane film for food packaging
Chromium oxide green	As a colorant in food containers
Dicyclohexylphthalate	Not to exceed 2.84 per cent in cellophane film for food packaging
Isobutene and isoprene or butadiene	Not to exceed 8.0 per cent in wax coating for food packaging
Oleic acid, potassium soap	As defoaming agent in paper and paperboard used for food packaging
Oleic acid, sodium soap	As defoaming agent in paper and paperboard used for food packaging
Paraffin, synthetic (Fischer-Tropsch)	Not to exceed 15 per cent in coatings for food wraps
Phthalimidoethyl propionate	Not to exceed 0.71 per cent in cellophane film for food packaging
Polyamide resin (dimerized vegetable fatty acid and diethylenetriamine)	As components of food wraps
Polybutene	Not to exceed 8.0 per cent in wax coating for food packaging
Polyglycol 200	Not to exceed 0.60 per cent in cellophane film for food packaging
Polyglycol ether of octylphenol containing 5 mols of ethylene oxide	As defoaming agent in paper and paperboard used for food packaging
Polyglycol ether of octylphenol containing 10 mols of ethylene oxide	As defoaming agent in paper and paperboard used for food packaging
Polyoxyethylene (20) sorbitan monostearate	Not to exceed 0.06 per cent in cellophane film for food packaging
Sorbitan monostearate	Not to exceed 0.06 per cent in cellophane film for food packaging
Tetrahydrofuran	As solvent in preparation of cellophane for food packaging
Triphenyl phosphite, alkylated	As a food packaging component
Ultramarine blue	As a colorant in food containers and liners thereof

(*Continued from page* 14)

for acetone-hydrogen peroxide mixtures when used as a dough conditioner. (The J. R. Short Milling Company, Chicago, Illinois.)

A tolerance of zero for metaldehyde in or on strawberries treated with this additive. (Commercial Solvents Corporation, Terre Haute, Indiana.)

The use of propylene glycol alginate as a stabilizer in cream cheese and neufchatel cheese. (Kelco Company, San Diego, California.)

A tolerance of not less than 100 parts per million (0.025 percent) for 1-(4-amino-2-*n*-propyl-5-pyrimidinylmethyl)-2-picolinium chloride hydrochloride in medicated chick starter and finisher feeds. (Merck and Company, Inc., Rahway, New Jersey.)

A tolerance of 8.8 parts per million (0.00088 percent) of oxytetracycline activity and 2.2 parts per million (0.00022 percent) of oleandomycin activity (impregnated on a suitable carrier itself not a food additive) in medicated swine feed. A zero tolerance in uncooked edible tissues of treated animals when the feed is used as directed. (Chas. Pfizer and Company, Inc., Brooklyn, New York.)

A tolerance of 100 parts per million (0.01 percent) of quinine hydrochloride (U.S.P. XV) as a flavoring agent in carbonated beverages (Schweppes (U.S.A.) Ltd., New York, New York.)

A tolerance of 100 parts per million (0.01 percent) of quinine sulfate as a flavoring agent in carbonated beverages. (Canada Dry Corporation, New York, New York.)

Use of resins composed of (1) homopolymers of ethylene and (2) copolymers of ethylene and other 1-olefins in packaging, processing, packing, transporting, or holding foods. (Phillips Petroleum Company, Bartlesville, Oklahoma.)

A petition on almost 200 can lining substances which have previously been listed as being the subject of extension actions published in the FEDERAL REGISTER of March 17, 1960 and include the items on

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food regulations

which decision is pending. (Can Manufacturers Institute, Inc., Washington, D. C.)

The use of sources of radiation to include certain radioactive isotopes producing radiations with energy levels not to exceed 2.2 million electron volts for the purpose of inspection of foods and food packages and for controlling food processes. (Industrial Nucleonics Corporation, Columbus, Ohio.)

A tolerance of not more than 450 parts per million (0.045 percent) by weight of free gossypol in cottonseed flour that is to be used in nonstandardized foods. (Traders Oil Mill Co., Cincinnati, Ohio.)

FDA approval for 3 feed additives

Three food additives used in animal feed under prescribed conditions have received FDA approval. They are chlortetracycline, oleandomycin and zoalene. The tolerances established for these additives are as follows:

For residues of chlortetracycline in edible tissues of chickens fed on chlortetracycline medicated feeds are established as follows:

(1) 4 parts per million (0.0004 percent) in uncooked kidneys.

(2) 1 part per million (0.0001 percent) in uncooked muscle, liver, fat, and skin.

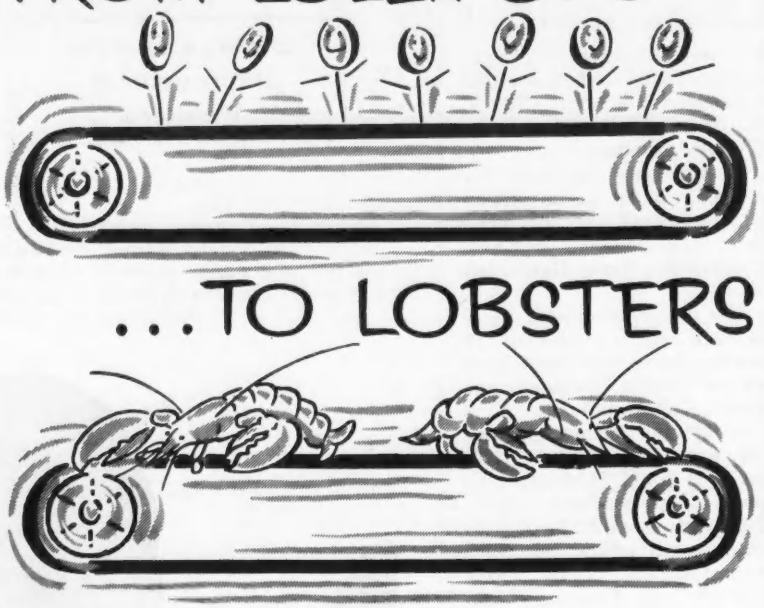
A tolerance of zero is established for residues of the food additive oleandomycin in or on the uncooked edible tissues or byproducts of chickens or turkeys.

Tolerances are established as follows for residues of zoalene (3,5-dinitro-*o*-toluamide) and its metabolite (3-amino-5-nitro-*o*-toluamide) in the edible tissues of chickens that have received medicated feed containing the food additive:

(a) 2 parts per million (0.0002 percent) in the uncooked muscle meat and fat of chickens.

(b) 6 parts per million (0.0006 percent) in the uncooked liver and kidneys of chickens.

FROM LOLLIPOPS



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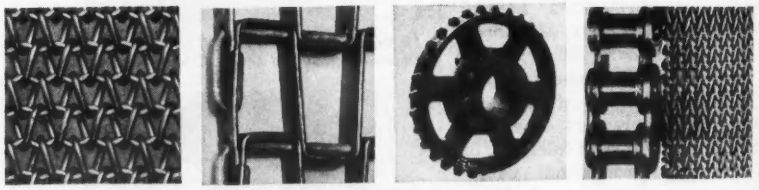

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Zero the desirable goal . . .

But regulations on frozen foods being set up by state authorities go beyond those required for protection of health

State authorities are using as their guide in setting up regulations on frozen foods the code of the Association of Food and Drug Officials of the United States, which has come to be known as the AFDOUS Zero Code. Regulations based on the code go into effect in Massachusetts August 1. Connecticut is expected to follow suit soon. Florida jumped the gun and adopted regulations a year ago before AFDOUS officially approved its Code.

Altogether, it is expected that about half of the states will soon have laws regulating not only the processing and production of frozen foods, but also their subsequent handling.

The AFDOUS code basically specifies zero degree Fahrenheit as the maximum temperature to be permitted in shipment, warehousing, subsequent distribution to retail stores, and display in refrigerated cabinets in the stores.

Specifically the Massachusetts' law requires frozen foods to be at zero or less before moved from a processor's plant, a cold storage warehouse, or a distributor's warehouse.

Vehicles used for transport of frozen foods are required to be capable of maintaining the load at zero. If a lot of frozen foods being unloaded from the vehicle has a temperature above zero but not above 10F, it may be accepted if the temperature is promptly brought back to zero.

A record must be kept of all lots received having a temperature above zero.

If above 10F, the lot may be accepted if requested by the shipper and the temperature is promptly brought back to zero. Subsequently, laboratory examination, (bacteriological, chemical, and organoleptic) must be made to determine the quality of the lot and its disposition.

Industry agrees that these specifications are desirable from the standpoint of providing a sufficient margin of quality protection for frozen foods until they reach the consumer. But it wonders how shippers and stores can meet the stringent requirements of zero temperature on such short notice.

On the other hand, state officials hope that competitive forces set in motion by their adoption of the AFDOUS Code will speed the necessary changes. Zero has or will become the condition for staying in business.

What the state officials apparently have not fully realized is the enormous task faced by industry, especially the truckers and stores, in modernizing to meet the zero requirement.

Thus it has been estimated that it will take the truckers at least five years and well over a hundred million dollars to make the necessary modifications.

If the zero code becomes widely adopted without provisions for a more reasonable period of time to modernize facilities, many people in the frozen food business may be forced into bankruptcy.

Industry would like to see laws based on practices which are essential not for guaranteeing quality but for protecting public health.

It is generally agreed that while pathogenic organisms may survive freezing temperatures, they do not multiply at temperatures below 20F, but this growth is not likely to be significant from a public health viewpoint.

Hence, if high bacterial counts are found in intact packages of frozen foods whose temperature has not been above 20F, this bacterial pop-

7436 on Reader Service Slip.

ulation is probably due to failure to maintain zero temperature.

Singling out frozen foods for special regulation in a quality code will undoubtedly give a misleading impression to the consuming public regarding the otherwise wholesomeness of frozen foods.

FDA action on 76 more additives

Latest GRAS list published by FDA lists 41 substances migrating to food from cotton and cotton fabrics used in dry food packaging. The list appears on page 63.

Two new lists of time extensions have been published; one for 17 direct additives, the other for 18 indirect additives used in food packaging. These lists appear on page 15.

By a change in an earlier time extension order there is now no specific limit on use of annatto colorants; however, they must be used "in accordance with good manufacturing practice." The original time extension, published on February 27, specified a limit of 35 parts per million.

FDA approves emulsifier for egg white products with limitations

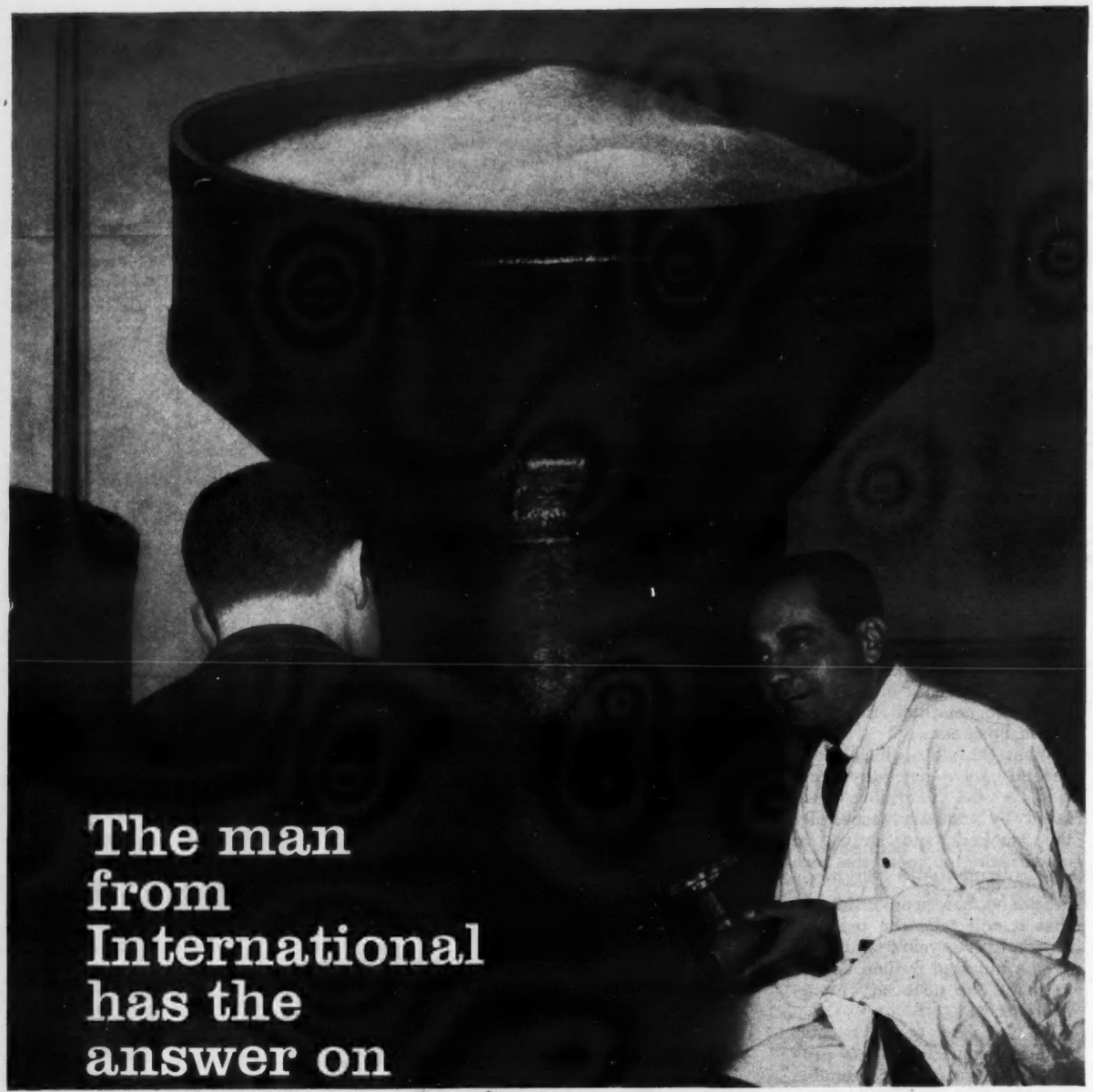
FDA has approved sodium lauryl sulfate as an emulsifier in egg white products. The additive must meet the following specifications:

(1) It is a mixture of sodium alkyl sulfates consisting chiefly of sodium lauryl sulfate (CH_3 $(CH_2)_{10}$ CH_2 OSO_3Na).

(2) It has a minimum content of 90 per cent sodium alkyl sulfates.

(b) It is used or intended for use in or with egg whites whereby the additive does not exceed the following limits:

Egg white solids _____
1000 ppm (0.1 per cent)
Frozen egg whites
125 ppm (0.0125 per cent)
Liquid egg whites _____



salt dissolving Here, the man from International Salt Company checks the rate of flow of a newly installed plastic Sterling Lixator* as his customer looks on, smiling. Reason for the smile: he's thinking of the time and money he'll save, thanks to this new salt-dissolving system. The exclusive Sterling Lixator is the most efficient and economical rock-salt dissolver ever developed. It simplifies the entire brine-making process, combining salt-storage, dissolving and brine self-filtration in one *automatic* operation. Lixate Brine is crystal-clear, fully saturated—and the only source of power used to produce it is gravity—which costs nothing. For expert advice on the particular Lixator for your needs, contact International Salt Company, headquarters, Clarks Summit, Pa. District offices: Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Phila., Pittsburgh, St. Louis.

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"A STEP AHEAD IN SALT TECHNOLOGY"

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125 ppm (0.0125 per cent)

(c) To insure the safe use of the additive, the label of the food additive container shall bear, in addition to the other information required by the act:

(1) The name of the additive, sodium lauryl sulfate.

(2) Adequate use directions to provide a final egg white product that complies with the limitations prescribed in paragraph (b) of this section.

FDA STANDARDS:

Bread: A petition has been filed proposing that the definition and standard of identity be amended by listing calcium iodate as an optional ingredient. The amount to be used would not exceed 75 parts per million on the basis of the weight of flour.

Calcium iodate is an oxidizing agent similar to others already approved as optional ingredients in bread. Petitioner is Red Star Yeast and Products Company, Milwaukee, Wis.

Canned Pineapple-Grapefruit Juice Drink: A definition and standard of identity has been proposed for this heat processed canned food.

Fruit juice ingredients in the product are pineapple juice, grapefruit juice, concentrated pineapple juice, and concentrated grapefruit juice.

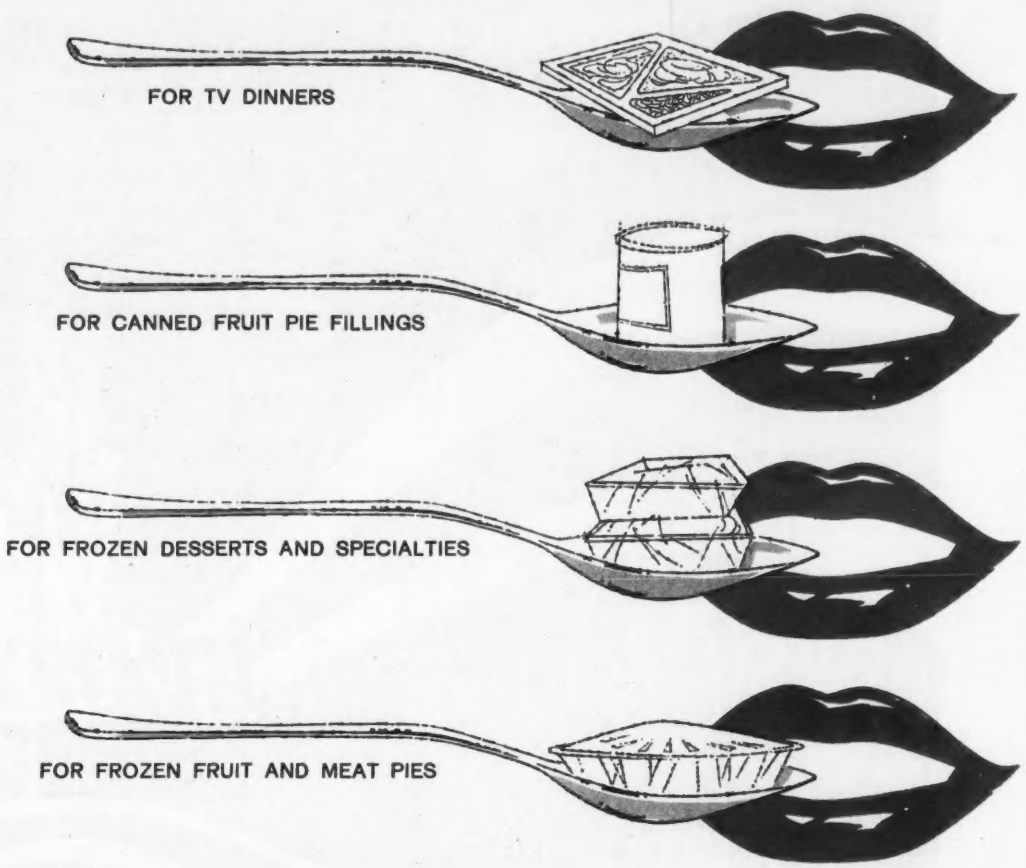
The adjusted weight of the combination of these fruit juice ingredients shall be not less than 50 per cent of the weight of the finished food. The pineapple juice ingredient is present in an amount greater than the grapefruit juice ingredient.

Water is limited to 50 per cent.

Optional ingredients are citric acid, citrus oil flavoring, sodium citrate and ascorbic acid and sweetening ingredients.

It is expected that there will be strong objections to this proposal which may go into public hearings. In products where water is an added ingredient there is usually disagreement on just how much

Col-Flo 67



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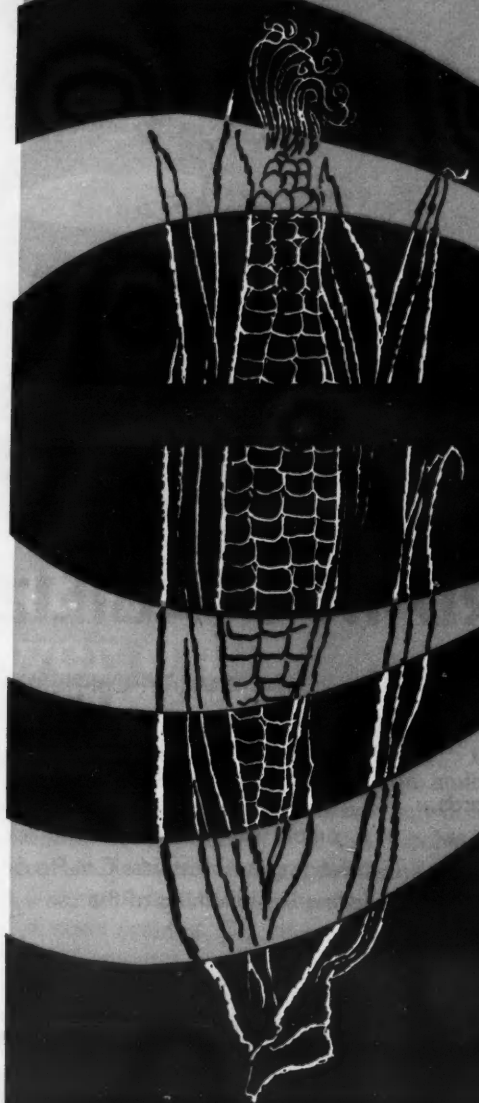

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should be present.

Petitioners for this standard are the California Packing Corporation and the Hawaiian Pineapple Company, of California, and Gerber Products Company, Fremont, Michigan.

Cheddar, Washed Curd, Colby, Granular and Swiss Cheeses: The order to amend this standard has been stayed and a public hearing will be held, probably this summer.

The petition provided for optional use of limited amounts of hydrogen peroxide and catalase for treating milk used to make these cheeses.

Objections were filed to the final order by the State of Wisconsin, Kraft Foods Division of the National Dairy Products Corporation, and the Wisconsin Swiss and Limburger Cheese Producers' Association.

Sweet Potatoes: Two amendments have been proposed to the sweet potato standard.

Louisiana canners have objected to the name "pieces" as optional forms in the existing standards. One canner would like to have the term "halves" or "halved" added as optional forms, along with "whole" and "mashed."

It is expected that other Louisiana canners will request the word "cuts" to be added.

The second request, from Corn Industries Research Foundation, is for use of corn syrup as a sweetener in the packing medium for sweet potatoes.

Preserves: The National Preservers Association has requested official approval of antifoaming agents in preserves. This is under consideration by FDA but since the question involves a food additives matter the agency may have to ask for an additives petition as well. A decision has not been made as yet.

Tomato Puree: The order amending the standard of identity for tomato puree is now effective. It permits use of the label term "concentrated tomato juice" on products containing not less than 21 per cent of salt-free tomato solids.

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"SCHLITZ DEFEATS DUST" — FOOD ENGINEERING magazine reprint describes all out dust control for 3½ million bushel Schlitz grain elevator. Request Bulletin "Schlitz Defeats Dust."

"EFFICIENT DUST SNATCHERS" — Bulletin describes DAY's part in providing maximum safety and good housekeeping for starch packing building of large food processor.

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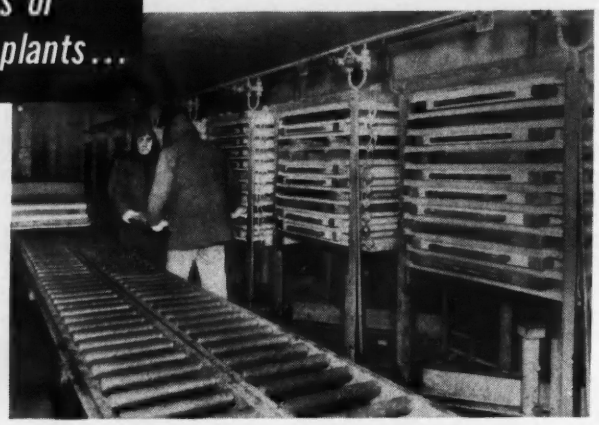

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genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
genetron 114 BLUE LABEL $C_2Cl_2F_4$ DICHLOROTETRAFLUOROETHANE

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food regulations

How to process stilbestrol-treated chickens for food use

The 12 million pounds of diethylstilbestrol treated caponettes, diverted from normal market channels at the request of HEW Secretary Arthur Flemming and subsequently purchased by USDA, are now slated to wind up as canned-boned meat.

USDA has requested offers to process the caponettes. The processing operation will recover the wholesome dark and white meat but eliminate diethylstilbestrol tainted skin, liver and kidneys. Processing will be under the supervision of the Poultry Inspection Service. The end product will be offered to states for distribution to welfare institutions eligible to receive donated commodities.

Proposes standards for frozen shrimp

Proposed voluntary standards for grades of frozen raw headless shrimp have been issued by the Department of the Interior. The regulations, if made effective, will be the first issued by Interior prescribing government standards for this commodity. Compliance with these standards, however, does not excuse failure to comply with the provisions of the FD&C Act.

The standards define the product and classify the shrimp in four grades: "U. S. Grade A" or "U. S. Fancy"; "U. S. Grade B" or "U. S. Good"; "U. S. Grade C" or "U. S. Commercial"; and "Substandard."

Other factors described are quality and grade, size, flavor and odor requirements, definitions and methods of analysis, and lot certification tolerances.

A complete copy of the standards is carried in the May 7 Federal Register and within a few months copies will also be available from the Dept. of the Interior.

There are 32 processors

who avail themselves of the Department's continuous inspection service. These plants pay for this service.

Voluntary standards for frozen salmon steaks

Voluntary standards for frozen salmon steaks will become effective this month. The standards were developed by the Fish and Wildlife Service of the Department of the Interior in cooperation with the fishing industry. Firms adopting the standards and the accompanying inspection may mark the product "U.S. Grade A" or "U.S. Grade B."

The standards give a detailed description of the product, styles of pack, recommended dimensions and factors of quality and grade.

Copies of the standards will be available from the Interior Department after next month or in the Federal Register for May 5.

Seizes milk and milk products contaminated with pesticides

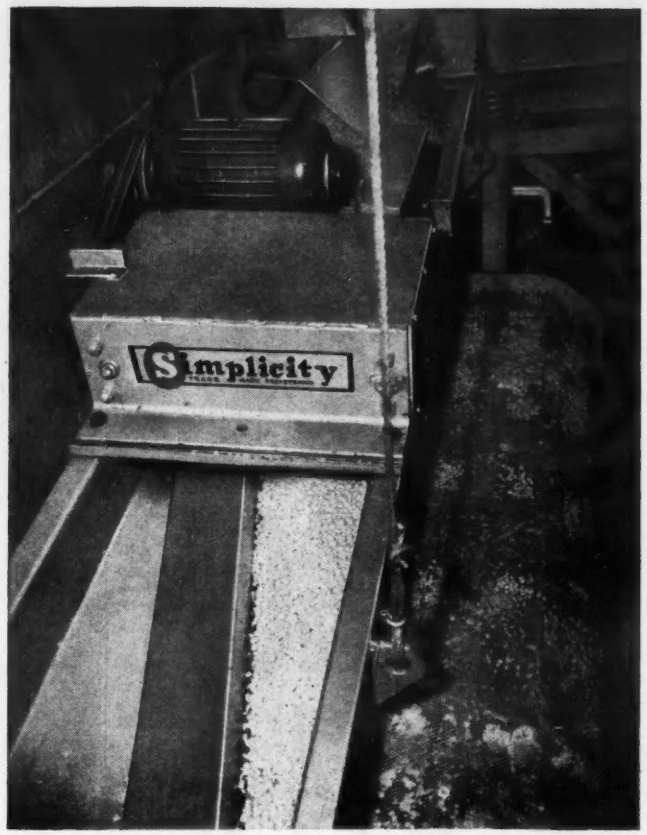
Proving it means business in getting pesticides out of milk and milk products, FDA in recent months has seized six shipments of evaporated milk from two manufacturers and one shipment of butter from another.

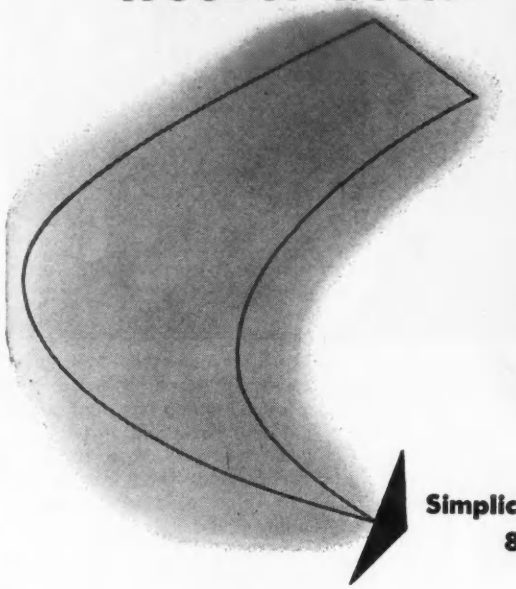
Cases of milk seized totaled 2642, valued at almost $18,000. The shipments originating in California were consigned to Hawaii, Guam and Seattle, Washington. The butter, amounting to 23 cases, worth $662, had also been shipped from California to Hawaii.

To objections that it is impossible to produce evaporated milk without the likelihood of contamination, FDA has countered that in one manufacturer's output other lots had been sampled at the same time as the seized lots — and these other lots carried no pesticide residues.

Besides running down lots

for fast, even feeding of freezer belts



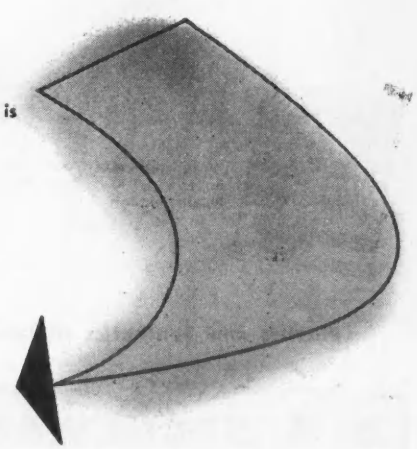


Simplicity 18″ x 11′-0″ KA Stainless Steel Feeder Feeds 8,000 lbs. of Corn or Peas Per Hour—Entire Width of Freezing Belt

A problem familiar to all frozen food manufacturers is even distribution of product over the entire width of the freezing belt. This problem is solved with a SIMPLICITY Stainless Steel Feeder.

The feed end of the feeder is equipped with a 3 foot section of Bixby-Zimmer decking which dewaters the product. The remaining 8 feet of deck surface is slotted diagonally, allowing the peas or corn to be deposited at the correct depth and distributed across the full width of the freezing belt. The product flow is regulated by a gate, positioned along the diagonal slot, which is adjustable from a closed position to a 2 inch opening.

SIMPLICITY engineers are ready to help you on any food handling problem. Write Department 7 or call SIMPLICITY ENGINEERING COMPANY, DURAND, MICHIGAN. Phone 46.



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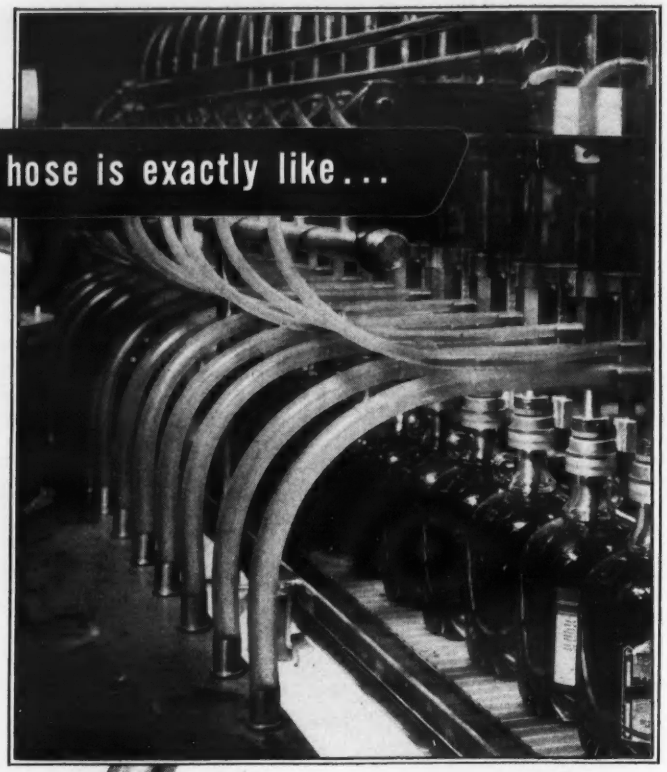

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Glass-like clarity—permits visual inspection of flow at any point.

Easy cleaning—Tygon lines may be disassembled, cleaned or steam flushed and reassembled in minutes.

Sixty-five bore sizes—1/16" i.d. through 4" i.d. to accommodate virtually any plant requirement. Simple clamp fittings make for fast easy coupling or uncoupling. No other tubing is exactly like Tygon B44-3. The complete story—fully detailed, graphically illustrated, is yours for the asking.

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in violation of the law, FDA is also trying to find out how the products are getting contaminated. In the case of the butter, the only evidence they could obtain points very strongly to the idea that the pesticide got into the milk supply as a result of feeding cows strippings from lettuce obtained from packing plants. These would be outer leaves which would carry the greatest amount of residue.

The "how" in the evaporated milk situation is being actively investigated.

FDA has been eyeing cheeses for contamination but so far no pesticide residues have turned up.

No tolerances have been established for any pesticide chemicals in milk.

Announces poultry chilling controls

Following extensive tests, USDA has developed new procedures to control amount of moisture absorbed by poultry during processing and chilling. USDA is reminding processors of their responsibility under the Poultry Products Inspection Act to keep the amount of moisture absorbed by poultry within limits necessary under "good commercial operation." USDA inspector teams have been assigned to check plants operating under federal inspection. They will weigh poultry before washing and after chilling to assure that satisfactory procedures are being followed.

Insecticides handbook

The USDA has announced the publication of the 1960 edition of the insecticide recommendation handbook. The handbook lists insecticides recommended for the control of specific insects attaching each crop, tolerances, and other procedures. Copies of the Agricultural Handbook No. 120 may be obtained from the Government Printing Office, Washington 25, D. C., at 65 cents a copy.

COL. ISKER

Instant bread mix, handling vehicle rate first Isker Award

The initial Rohland A. Isker Award for outstanding contributions to military food and packaging progress was presented to joint winners by the Research and Development Associates, Food and Container Institute, Inc., at their recent 14th annual meeting in Chicago.

One award went to three former members of the Quartermaster Food and Container Institute, Chicago, for work at the Institute leading to development of an instant bread mix using chemical leavening agents.

The development team included Dr. Samuel A. Matz, now head, refrigerated dough laboratory, Borden Research Centre, Syracuse, N.Y.; Charles S. McWilliams, now bakery production instructor, American Institute of Baking, Chicago; and Jason Miller, now bakery chemist, E. F. Drew and Co., Inc., Boonton, N.J.

The second award was presented to Joseph P. Akrep, container technologist at the Food and Container Institute, for development of a jeep-type, fork-lift vehicle for handling unit loads of military supplies.

Established in 1958, the Isker Award was named for Col. Rohland A. Isker (USA-ret'd.), secretary of the R&D Associates, who commanded the wartime Subsistence Research and Development Laboratory, Chicago — predecessor organization of the present QM Food and Container Institute.

The Laboratory had much to do with design and development of operational rations and packaging used in World War II.

The R&D Associates are a non-profit organization maintaining liaison on food and container research and development between military and industry. Some 230 firms in the food and container field, and more than 150 leading scientists from research and educational institutions make up the membership.

Currently, 40 task groups, with a total of 300 members, are coping with such problems as high-altitude "self-serve" foods for the Air Force, and all-purpose survival foods.

Joseph P. Akrep, left, of QM Food and Container Institute, receives Isker Award for development of unit-load handling vehicle from Clarence K. Weisman, vice chairman of Associates board

Winners of the Isker Award for developing an instant bread mix using chemical leaveners were former Food and Container Institute staffers Charles S. McWilliams, left, Jason Miller, center, and Dr. Samuel A. Matz

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Write for Bulletin No. 105

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District Engineers in Principal Cities

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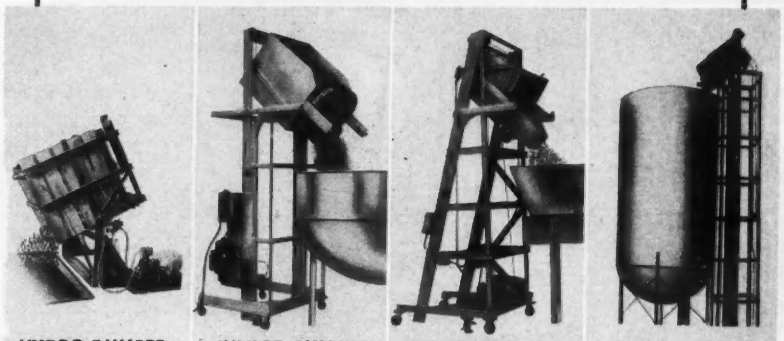

HYDRO-DUMPER Dumps up to 4 feet. Load capacity, 6000 pounds.

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SENIOR DUMPER Dumps up to 20 feet. Load capacity, 4000 pounds.

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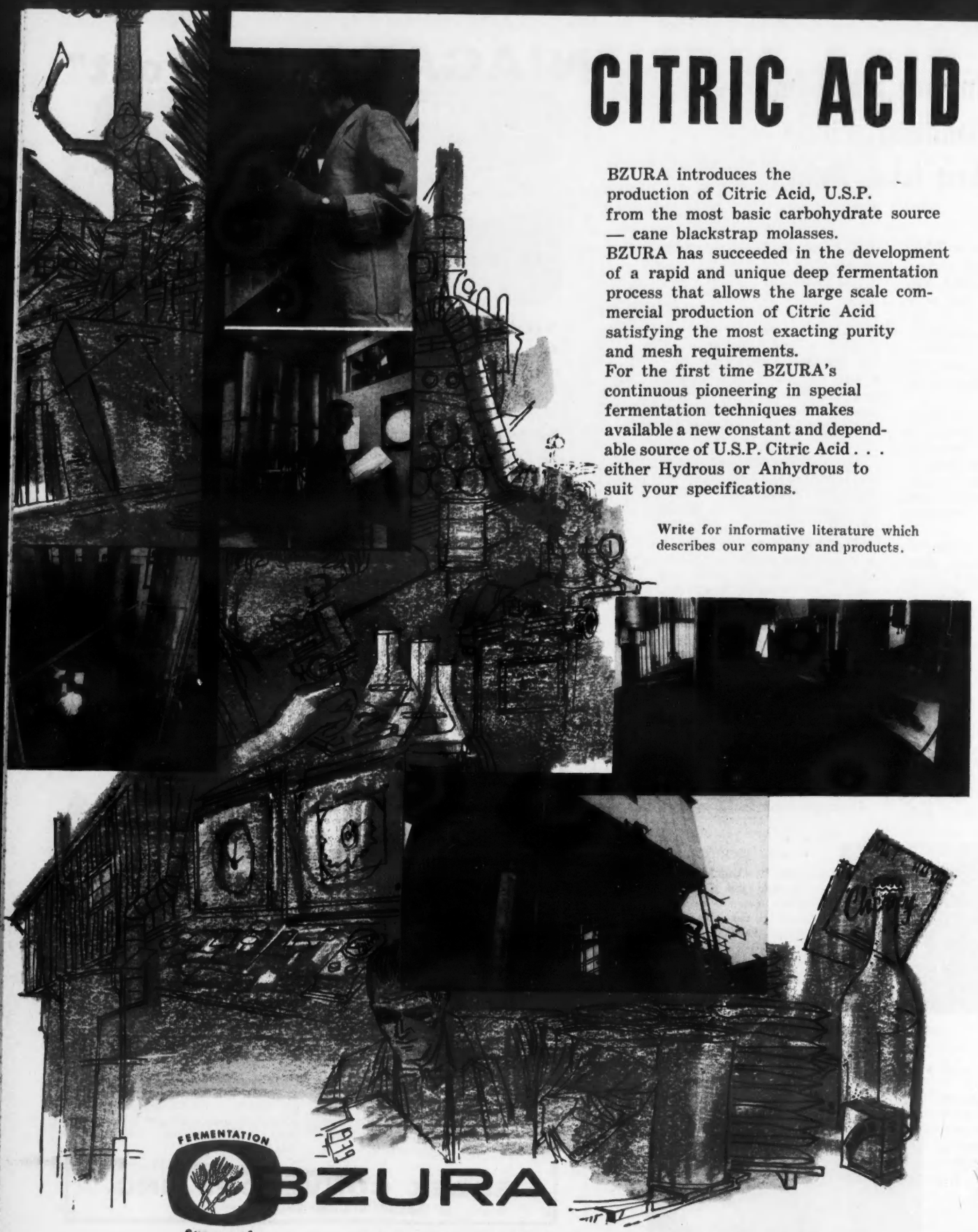

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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

FOOD PROCESSING

JUNE 1960
VOL. 21 NO. 6

Deadline imminent for

Humane Slaughtering . . .

A profitable investment?

Up-to-date guide to approved methods and equipment

FRANK L. BONEM
Associate Editor

After stunnning, hogs are dispatched from restraining pen in position to be stuck prone and raised for bleeding; or, animals can be shackled and raised immediately and stuck on bleeding conveyor

After June 30 of this year, humane slaughtering methods must be in effect in plants of meat packers desiring to sell their products to Federal Agencies. This is the only punitive aspect of the Federal Humane Slaughtering Law.

New methods of slaughtering, aside from being humane, contribute benefits to packers' operations.

There seems little doubt that, when considered over a period of years, methods of humane slaughtering will provide economies which will more than cover cost of installation and operation.

Point in case is Smithfield Packing Company, Smithfield, Va., where a carbon dioxide immobilization system recently went into operation.

According to J. W. Luter, Jr., president, method: ". . . eliminates needless livestock suffering, definitely improves products, provides safer, better working conditions and creates economies . . ."

Besides Federal Government, five states to date have passed humane slaughtering acts and a number of others have legislation pending. Canada too, has legislation pending.

Most of the state measures passed are similar to the Federal Act. Effective date is the same and a packer must comply if he desires to sell to State Agencies.

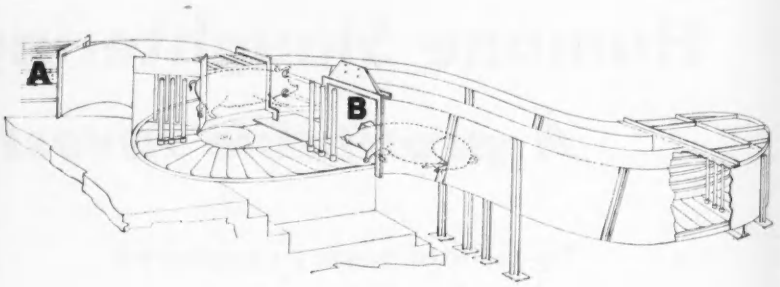
Two notable exceptions, Washington and New Hampshire, have fine or imprisonment or both for any packer using the sledge hammer or other inhuman methods of slaughtering.

Packers not doing business with Federal or State Agencies, or not operating under a state law, might nevertheless be forced to humane slaughtering methods because of pressure brought about by campaigns of humane society groups.

Ritual slaughtering methods are considered to comply with public policy expressed in Federal Law and therefore exempt from Act.

to next page

U-shaped tunnel will handle from 100 to 300 hogs per hour; requires floor area of only 28 by 9 ft. In photo, hogs enter tunnel at left (A), emerge unconscious at right (B). After shackling, animals are transferred to overhead conveyor for sticking and bleeding



USDA Approved

Three methods which have been designated as humane by the USDA, in accordance with provisions of the Federal Law follow. An up-to-date guide of equipment and approximate costs is given at end of article.

Mechanical: Use of captive bolt stunner or gunshot on sheep, swine, goats, calves, cattle and horses.

Chemical: Use of carbon dioxide gas for sheep, calves and swine.

Electrical: Stunning of swine, sheep, calves and cattle with electric current.

As other methods are shown to be humane, they too may be approved by the Government.

Because law covers more than actual stunning, mere installation and use of equipment does not necessarily mean compliance with Humane Slaughtering Act.

For mechanical stunning, approved method requires that captive bolt stunners or firearms produce immediate and complete unconsciousness with minimum of excitement and discomfort.

Approved methods require that gas or electric current be applied in such a manner so as to produce surgical anesthesia in animals quickly and calmly before they are shackled, hoisted, thrown or cast. Animals must remain anesthetized throughout shackling, sticking or cutting and bleeding.

Electrical stunning must be in such a manner so no hemorrhages or other tissue changes will be produced which would interfere with inspection procedure of the MID.

Animals must also be driven to point of actual slaughtering with minimum of excitement, discomfort and without inflicting pain.

Therefore pens and chutes through which animals are driven and restraining devices in which they are held, must be free from hazards that might accidentally injure or produce pain.

This is of particular importance when mechanical stunning methods are used since exact placement of stunner is often extremely difficult on nervous or injured animals. For calming animals prior to slaughter, tranquilizers can be used.

Tranquilizer drug which is available for administering prior to slaughter raises animal's resistance to stress or unfavorable stimuli. Drug is approved by FDA for use up to 24 hours prior to slaughtering in dosages sufficient to last from two to four days.

Much of the work in developing present methods has been done by meat packers and equipment manufacturers but USDA research is helping too.

There is still need for basic research on measuring tissue changes, measuring pain and depth of anesthetization. Studies are also needed on possible effects on post-mortem changes affecting keeping qualities of meat.

To date, four multi-plant packers* have received the American Humane Association seal for 100 per cent humane slaughtering, that is, use of humane slaughtering methods in all plants for all species of animals.

Methods vs Species

For cattle, only mechanical stunners are used at present. Other methods have not, as yet, proven themselves.

For calves, hogs and sheep all three approved methods, chemical, electrical and mechanical, have been successfully used.

Mechanical stunning of hogs however, is apparently not as popular as the other two methods, although it is being used by at least one packer in Canada.

Already proven for some time now, from very large to smaller production runs, are carbon dioxide tunnels and electrical stunners for immobilizing hogs.

Because calves and sheep are slaughtered in smaller numbers, development of humane slaughtering methods for these two species has somewhat lagged. However, installations using carbon dioxide have been made and mechanical and electrical stunners for calves and sheep have been developed.

Carbon dioxide process essentially consists of maintaining controlled atmosphere of gas and air in a tunnel which is depressed to minimize loss of gas which is heavier than air. Animals, riding individual compartments on a conveyor, ride through this tunnel. They are thus exposed to the gas and rendered unconscious by it.

Concentration of carbon dioxide varies from 65 to 75 per cent. (For one method of controlling concentration automatically, see page 29). Time of exposure depends upon weight of animals and production rate.

U-shaped tunnels and conveyors are used for smaller production runs, see photo above. Straight, in-line tunnels are designed for large production runs from 450-600 head/hr.

Electric stunning equipment consists of probe or handle through which current is applied, control box for regulating electricity and in most cases a restraining box and/or conveyor, see photo above.

These electric stunners use standard 110 V, 60 cycle current in such small amounts that operating costs are negligible. Only minor changes are required in plant layout for installation.

Mechanical stunners are devices which deliver blow by a captive bolt to render animals unconscious. Bolt may be of penetrating type and actually enter brain area, or of concussion type—if packer desires to leave brains fit for regular use—which delivers its force through mushroom head to skull.

Activated by gun powder from cartridge shells or by air, stunners can be placed on front of skull above eyes or against top rear of head behind horn boss.

* Packers with nation wide distribution that have received the American Humane Association seal are Geo. A. Hormel & Company and Oscar Mayer & Company.

Guide to Suppliers of Humane Slaughtering Equipment

Mechanical

Alfa International Corporation of New York City is marketing two models of Schermer stunner. Non-penetrating type is for calves and sheep; penetrating type can be used on cattle, swine, sheep and calves by varying power loads. Stunner costs $150 and cartridges from 2.7 to 3.5¢.

7447 on Reader Service Slip.

Koch Equipment Co. of Kansas City, Mo., is supplier of the Cash-X pistol, probably the first stunner on market to use blank cartridges. Pistol has penetrating bolt for all species.

Company recently developed concussion stunner. Pistol sells for $100, concussion knocker for $195. Cartridges cost about 2½¢.

7448 on Reader Service Slip.

Placement of concussion stunner on animal's head activates contact trigger that explodes cartridge. Force of explosion drives knocker head against skull

Remington Arms Company, Bridgeport 2, Conn., has number of models available for variety of operating conditions.

Latest stunner is of penetrating type but it can be made non-penetrating. Stunner is recoilless, has automatic retraction and can be operated with one hand. Cost of stunner is $175; cost of cartridges ranges from 2.3 to 5¢.

7449 on Reader Service Slip.

The Globe Co., Chicago 9, Ill., is sales agent for pneumatic stunners made by Thor Power Tool Co., Aurora, Ill.

Pneumatic stunner drives metal pin into brain or medulla oblongata (back of head); can be almost instantly refired in event operator makes inaccurate hit. Pin is activated by contact of trigger tube with animal.

Large pneumatic stunner is for cattle; has been used at rates up to 125 head/hr. Smaller model just placed on market uses percussion head and is designed for sheep. It has been proven capable of stunning 300 sheep/hr.

Price of cattle stunner is $495.

7450 on Reader Service Slip.

Stunner uses 22 caliber power loads in five graded strengths for rendering all weights of cattle, calves, hogs and sheep unconscious. Blow can be delivered to pate or back of head. Penetrating pin extends from right side when fired

Percussion-type sheep stunner has 17 in. cylinder and 18 in. handle. Head is activated by touch to animal's head

Electrical

Alfa International Corporation, New York 16, N.Y. is marketing the Schermer stunner which consists of a pair of aluminum tongs, cable and transformer. Three variations are available with prices ranging from $198 to $450.

For good operation, restraining device is needed which costs an additional $1345.

7451 on Reader Service Slip.

The Cincinnati Butchers' Supply Co., Cincinnati 16, Ohio, has available an electrical stunning system developed and being used in Europe.

Restraining equipment includes an entrance conveyor, restraining conveyor and gravity-roller conveyor for discharging.

7452 on Reader Service Slip.

The Globe Co., Chicago 9, Ill., is offering electrical stunning system that has dual needles on probe which are applied to head of animal just above eyes.

Restraining pen used with stunner holds hogs immobile until stunned. Floor of pen is a belt conveyor. Controls for current and squeeze box are located on probe handle. Estimated price ranges from $4150 for complete installation.

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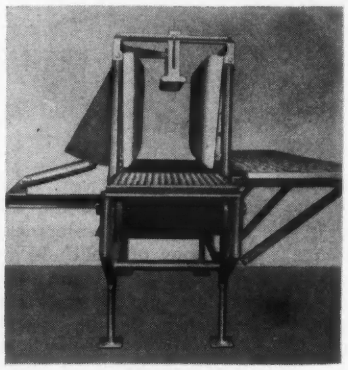
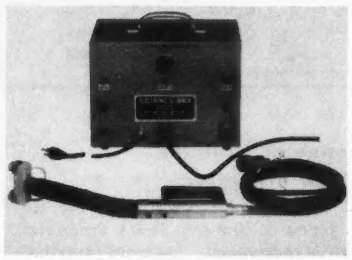


Restraining pen has 4-in. thick foam rubber pads for holding hogs immobile while current is applied. Neoprene belt conveyor discharges stunned animals

The Great Lakes Stamp & Manufacturing Co., Chicago 18, Ill., markets system that also has



Buttons on probe control squeeze pen. Current flows only when pressure is applied with probe against hog's head. Hogs up to 350 lb are stunned in 1 sec; 500 lb in 2 sec; 700 lb in 4 sec

dual needles on probe, and adjustable controls for time and current. Restraining pen has two moving sides which pivot in and up, literally lifting animal off its feet to hold it.

System has been proven at rates of 300 to 400 hogs per hour. Price is about $4000.

For slaughtering calves and sheep, firm has developed special restrainer pen.

7454 on Reader Service Slip.

Squeezing pen is approximately 11 ft long and 8 ft wide at highest point. Air at 60 psi is supplied to pistons to move sides

H. J. Mayer & Sons Co., Inc., Chicago 36, Ill., is selling electric stunner developed in Canada and used there for slaughtering hogs at rates up to 400 head/hr.

Unit should be available for use with calves and sheep in about two to three months. Price of equipment is about $4900.

7455 on Reader Service Slip.

Preservaline Manufacturing Company of Flemington, N.J. is offering equipment that includes probe, power pack and conveyor having four-ft high restraining walls. Price is about $3500.

7456 on Reader Service Slip.

Chemical

The Allbright-Nell Co., Chicago 9, Ill., under license from Hormel Company, Austin, Minn., is manufacturing carbon dioxide immobilization equipment, see photo and illustration page 30. Prices range from $5000 for small units up to $45,000 for large units.

7457 on Reader Service Slip.

Drugs

Jensen-Salsbery Laboratories, Inc., Kansas City, Mo., is marketing animal tranquilizer which acts in 30-45 minutes after being injected. Recommended dosage varies from 2 cc for up to 200-lb animals to 8 cc for animals of 800 lb and over. Approximate cost for feeder cattle is $0.75 to $1.00.

7458 on Reader Service Slip.

Advance spray-drying techniques

Sheffield solves problem of drying hygroscopic, heat-sensitive products

HOWARD P. MILLEVILLE, Editor

Problem: Horizontal-type spray dryers which are commonly used in the dairy industry are not satisfactory for certain products — especially some of those now under development by Sheffield Chemical Division of National Dairy Products Corporation.

Problems were encountered not only in drying but also in removing the materials from the dryer proper. The solids obtained are frequently characterized as thermoplastic, thermosetting, hygroscopic, and clingy and, of course, all are heat-sensitive.

Several years ago the Research and Development laboratories of Sheffield secured a small vertical laboratory model from Bowen Engineering, Inc., North Branch, N.J. In this Bowen dryer, the drying air and feed are introduced at the top, and the product undergoes dessication as it is carried down to the conical bottom.

Coarser particles are ejected from the bottom of the cone; finer particles are carried out with the exhaust air and ejected from the primary and secondary cyclone separators.

While this small laboratory model was modified to operate satisfactorily under a variety of processing conditions, its production rate was too small to produce the sizeable "samples" of product required for test evaluation without lengthy operating runs.

Solution: Based on the experience obtained with the small Bowen dryer, a large pilot plant dryer was designed for use not only for small production runs required for test market product development but for research on special operating conditions.

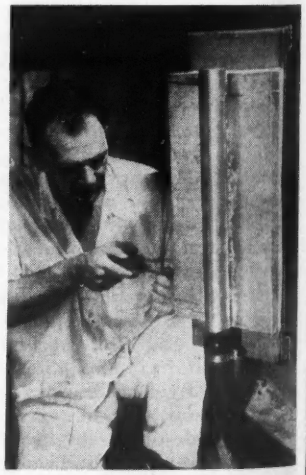
The unit, also constructed by Bowen and shown in the accompanying illustrations, is of 304 stainless steel. A tall vertical spray-dryer design was selected with the cylindrical portion of the drying chamber 7 feet in diameter and 16 feet in height. The steep conical bottom of the dryer from which the primary collection is made is 9 feet high. With operating deck extensions and superstructure necessary for the dryer, the unit extends to an overall height of 40 feet from the plant floor.

Cold air inlets

For the drying of the many heat-sensitive and extremely hygroscopic materials six Bowen-patented cold air ports have been installed for the introduction of room temperature air: two at top, two in middle, and two at bottom as shown in the flow diagram.

In entering co-currently, this ambient air forms a rotating air zone adjacent to the side wall. The air zone serves not only to shock-cool the solids which migrate to this area, but also to keep the uninsulated dryer wall cool.

The two lowest ports allow introduction of dehumidified



Operator is making adjustment in rate of cool dehumidified air admitted to cold air ports which shock-cools and keeps walls of dryer and conveying outlet air at lower temperature and relative humidity

Development facilities aid food processors

Sheffield Chemical Division of National Dairy Products Corporation offers an experienced technical service staff to assist food processors in obtaining the greatest possible economic and functional advantages from the use of its widely known Sheftene line of high-quality, concentrated milk proteins. These find application in various food products as a protein fortifying agent and as an edible emulsifier and stabilizer.

The technical service is extended not only to formulation but also to any additional processing involved. Thus, new formulations for a vegetable-fat topping mix can be carried on through the spray-drying step on an experimental production basis in the spray dryer described in this article.

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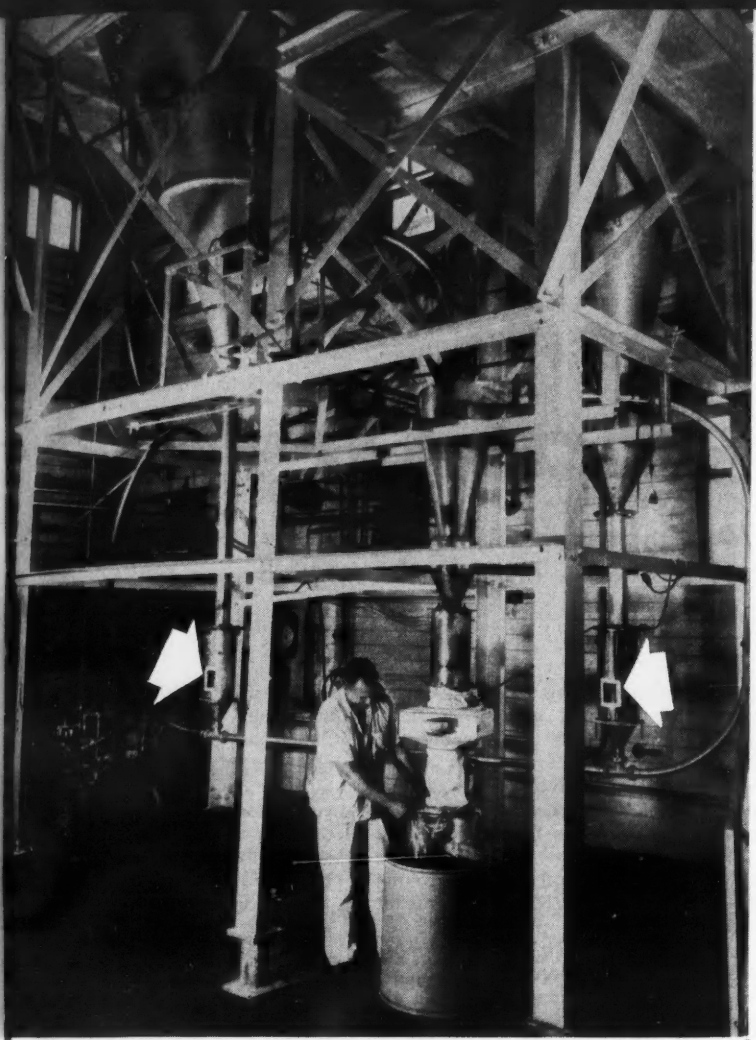
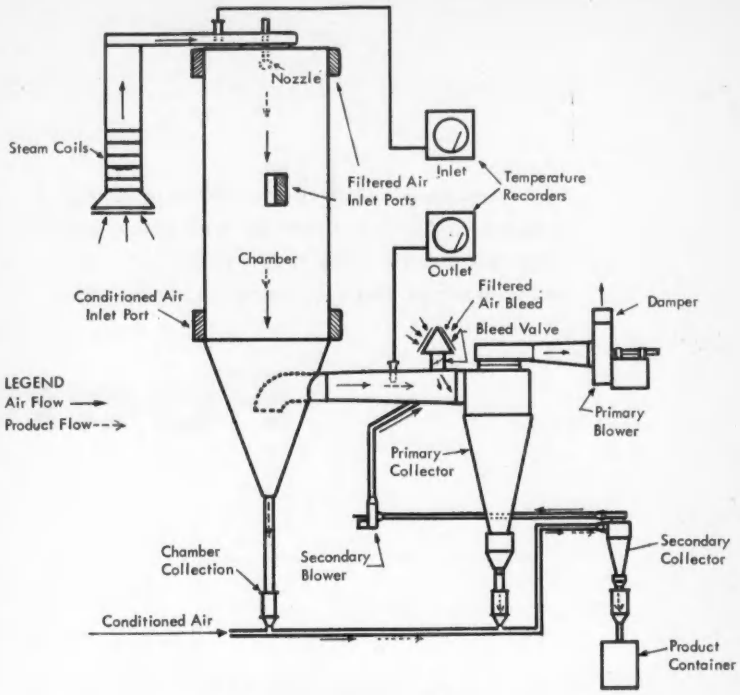




The Spray Drying Operation

Flow diagram of Sheffield's drying system is shown above. Overall views of the system appear on the cover and in the photo at left. Arrows on the photo point to viewing ports where operator can check flowability and other characteristics of dried product.

Drying air, heated to 325°-340°F, depending upon product being processed, is obtained from a heater which is supplied with steam at 125 psig. Approximately 1000 lbs of steam are consumed each operating hour, for an average ratio of four pounds of steam per each one pound of water evaporated. These figures vary depending on operating conditions necessary for a given product.

The heated air is drawn through the spray drying equipment by an exhaust fan. Five manometer taps check the pressure drop at critical points in the system and detect quickly any misadjustments which might occur.

Since the entire system is under suction, the volume of heated inlet air drawn into the chamber depends on whether or not cooling air is admitted. However, additional air from cold air ports is compensated for by an oversize exhaust fan and an air bleed. If all cold air inlets are closed, all air drawn through comes from the air heater. By opening all or only a portion of the cold air ports, the amounts of cooling air can be controlled to any desired amount.

Feed solution is pumped from two jacketed feed tanks to a high pressure pump, which, in turn, introduces the solution to the dryer, with or without a filtration step, depending upon the product. The feed is forced through the spray nozzle at a rate of up to 325 lbs of liquid an hour, again depending upon percentage of solids, which is extremely low on of some Sheffield spray-dried products.

Although the company is using a pressure atomizing nozzle, the dryer is constructed so that Sheffield may also utilize one of the many Bowen-patented centrifugal atomizer wheels driven by a Bowen Spray Machine.

As the solution is forced through the nozzle into the drying chamber in a fog-like mist, rapid dehydration occurs as the droplets hurtle swiftly down the 16-foot vertical chamber and through the nine-foot cone from which it ultimately is collected.

At point of discharge, the temperature of the air exhausted ranges from 175° to 220°F, depending upon the various factors previously discussed. The lower outlet temperature is used for those products requiring shock-cooling as they are rushed rapidly through the dryer.

Product temperatures at point of discharge — as distinct from dryer temperature — range from 85° to 90° F for shock-cooled particles to as high as 140°F for those particles which do not require cooling air in the chamber. The difference between particles and drying air temperatures is accounted for by the cooling effect of evaporation.

Should it be necessary to enter the chamber for any reason whatsoever, the entire chamber interior is fully accessible within minutes through a door. The Bowen unit, specially-built to fit Sheffield's present development picture, can be adapted to allow installation of a gas-fired booster for heating air if it becomes desirable. Additional collectors may be installed if desired.

air when drying hygroscopic particles.

In addition to these special features, the dryer is designed for direct collection of powder at the base of the chamber as well as from primary and secondary cyclones.

The ultra-heat-sensitive particles drop directly from the drying chamber into an air conveyor and cooling system which again shock-cools them — offering further insurance against heat damage.

This air conveyor has visual ports for observation of the system during operation. Design features include tangential air sweeps and large access ports for inspection and thorough cleaning.

Since so many of the particles are sticky and would have a tendency to adhere to the dryer or collector walls, vibrators have been installed throughout the system. Normally, spray-dried particles do not "cling," but the peculiar nature of some of Sheffield products, especially fat formulations, makes the Norwich operation somewhat unique. Thus, vibrators, not usually a part of Bowen spray-dryer installations, have been installed on the vertical and conical chambers of the dryer and on the first cyclone, for use when advantageous.

The unit installed makes it possible to make experimental studies on a production scale with as little as 30 lbs of dried product per test. END

7460 on Reader Service Slip.

Important developments are coming in instant dehydrated foods not only for fruit and vegetable juices but also for *baby foods*, purees, and fruit whips. Here is a progress report on . . .

Foam-Mat Drying

More than fourfold increase in rate; some products dried in five minutes

FP STAFF

Based on information from: A. I. Morgan, R. P. Graham, L. F. Ginnette, and J. M. Randall of the Western Utilization Research and Development Division, USDA; also Paul Mariani, Jr., President of Paul Mariani Co., Cupertino, Calif.

Foam-mat drying, an invention of the USDA, is still in the pilot-plant stage of development. But important improvements bring it closer to becoming an established process for use by industry.

Outstanding characteristic of the products is their fine foam structure, so that reconstitution is extremely rapid even in cold water.

Tomato paste and concentrates of orange, grape, pineapple juices, apricot puree, lemonade, soup broths, whole milk, eggs, and coffee have been prepared by foam-mat drying.

Also prepared by this process have been baby foods and prune whip. One company, Paul Mariani Co. of Cupertino, Calif., is working on an apricot whip, among other products.

The dehydrated fruit whips after reconstitution can be whipped for serving since foam drying does not destroy the emulsify agent of the formula.

At the USDA Fruit and Vegetable Products Lab in Winterhaven, Fla., a new foam-mat facility has been set up for studies on orange juice in cooperation with the Florida Citrus Commission.

When foam-mat drying was first tried last year at USDA's Western Lab, drying time was 65 minutes. Using improved methods, drying time has been reduced to 15 minutes and in some cases to 5 minutes.

Foam-mat drying is similar to puff drying. Both start with conventional high-grade concentrates. In puff drying the process is carried out under vacuum and the foam is created by release of gases from the liquid as the liquid enters the vacuum.

Unlike puff drying, foam-mat drying is carried out at atmospheric pressure. A stiff foam is obtained by whipping after addition of an edible foam-producing stabilizer to the concentrate to be dried.

Edible stabilizers used include mono- and di-glycerides, hydrolyzed soya protein, egg white, and sucrose esters.

The stabilized foam is extruded onto a belt of a conventional cross-flow dryer or onto trays in the three different techniques developed at WURDD:

1. Originally, foam was extruded onto a belt in the form of a continuous mat; hence the name.

2. Faster drying time was obtained by extrusion of foam onto belt in spaghetti-like strings — see photos.

3. Newest method is crater technique. Foam is deposited on perforated metal trays. Drying air flows upward through holes forming craters to increase the exposed surface area about five fold. This technique as well as a proposed continuous dryer is illustrated in the diagram.

In all cases drying to a 2 to 2½% moisture level is achieved. The dried foam is flaked or ground. It may be compressed into pellets without loss of easy solubility in cold water.

Thus, a dried foam of 0.2 sp g can be compressed into tablets having a sp g of 0.8. (Grinding the tablets produces a powder having a sp g of 0.6.)

For storage stability, the product is packaged in moisture-proof containers with oxygen-free gas.

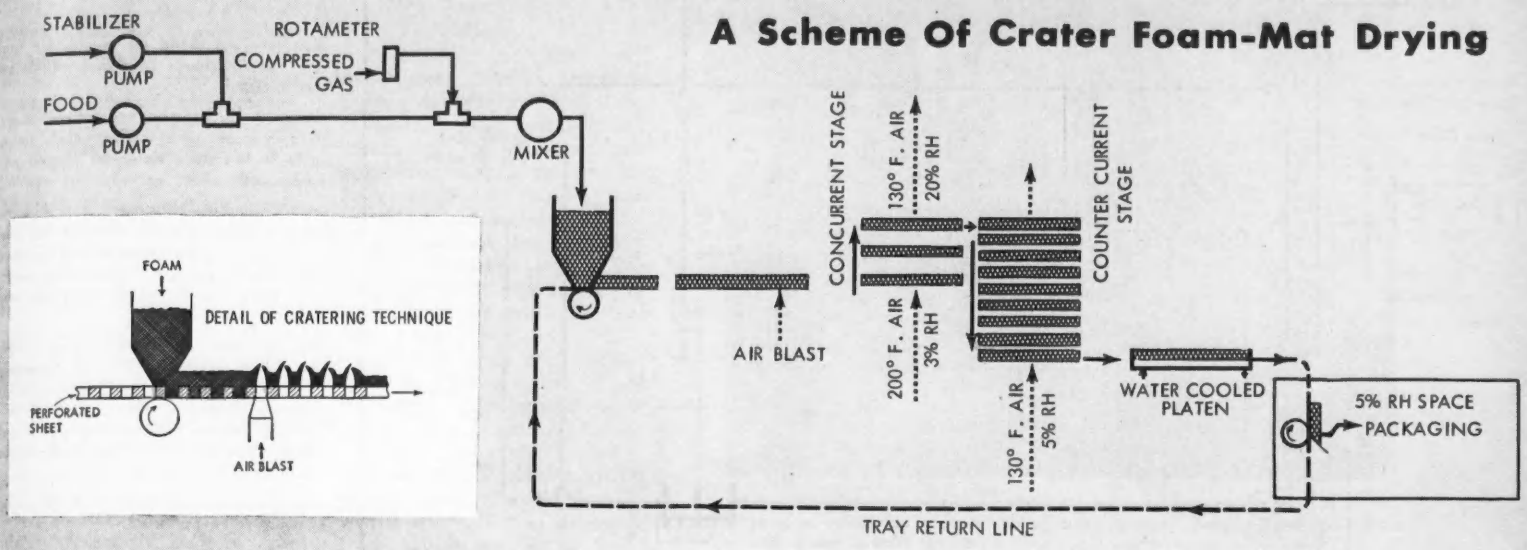
Foam-dried products initially have a high quality. Reconstituted flavor is very close to that of the original concentrate.

Shelf life, however, is not as long as desired for commercial use. Hence, one of the objectives of current research is finding ways to increase length of time product retains high quality.

Under study are various refinements in drying techniques. In addition it may be possible to increase stability of dried product by incorporating an antioxidant in the concentrate prior to drying and perhaps forming the foam with an oxygen-free gas.

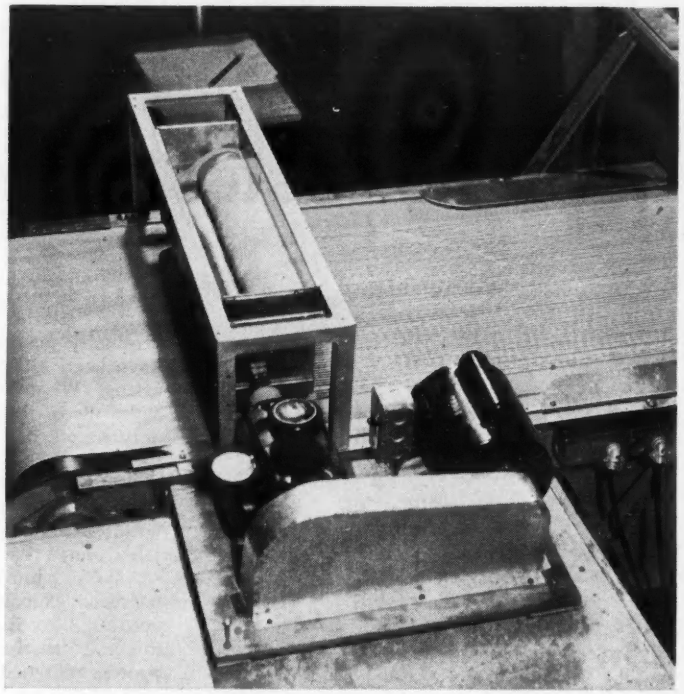
Public service patents are pending on the process. For additional information on the process as well as its use, write to The Director, Western Utilization Research and Development Branch, USDA, Albany 10, Calif. END

A Scheme Of Crater Foam-Mat Drying



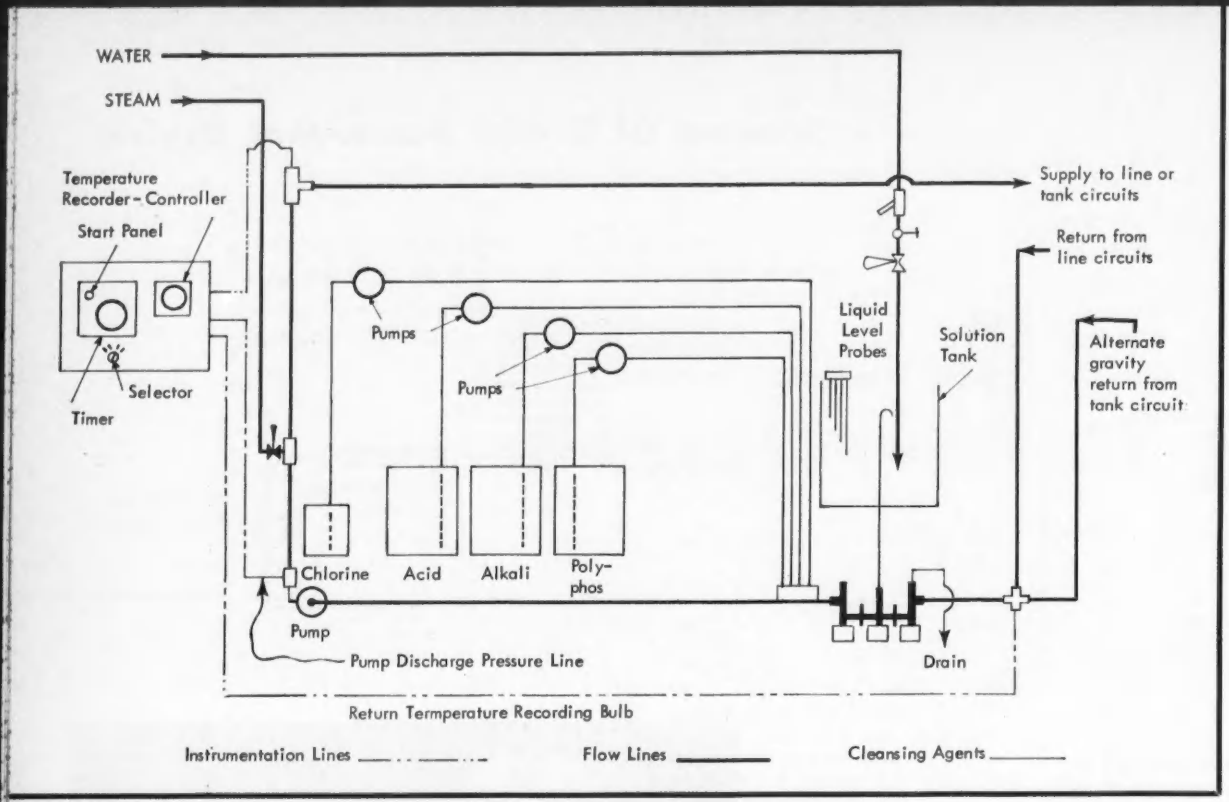
Crater technique of foam drying

To increase surface area, an air blast blows up through the layer of stiff foam forming craters. The foam is first deposited in a 1/16 inch layer on a perforated metal tray. Trays have 1/8th inch holes on a 3/16 inch center (40% open area). Detail of the method of forming craters is shown in inset above. A flow diagram of a proposed continuous operation is shown in the gray area. The trays would be handled mechanically. In the first stage after the air blast stage, the drying air flows concurrently with the trays; in the second stage the cooler drying air flows countercurrently. Typically the drying time in the second stage is three times as long as that in the first stage. Thus, if 2 minutes were required in the first stage, 6 minutes would be required in the second stage for a total drying time of 8 minutes. About a half pound of dry product (2% moisture) per square foot of tray per hour can be expected.



Spaghetti technique of foam drying

Starting from foamed concentrate, the prune whip shown in the hopper is extruded into a spaghetti-like shape onto a Teflon or Mylar coated belt as shown in the photo above. The belt of this experimental unit is 24 inches wide and travels 17 ft through a drying tunnel, discharging product as shown in photo at left. Temperatures of drying air at beginning a cycle is as high as 180 F to as low as 120 F at discharge end. A typical production rate is 5 lbs dried product per hour. The unit being installed for drying of orange juice at Winterhaven will have about twice this capacity.



Solutions are made up in solution tank only when process lines and equipment are cleaned.

When tanks are cleaned, valve operation is such that solution tank serves only to introduce water for rinsing and controlled volume of water for washing.

Four liquid-level probes control water at two different levels for tank and line cleaning. Probes also cause solution-tank outlet valve to close after water has been transferred at start of tank washing operation.

During actual recirculation wash period of tanks, solution tank is bypassed. Water is drawn directly from tank being cleaned through valve manifold into suction side of recirculating pump and then discharged back into product tank through spray head.

Remote-controlled two- and three-way valves are air operated.

Heating of solutions is by direct steam injection into discharge side of recirculating pump through SS, noiseless steam mixer. Cleaning temperatures are automatically controlled.

Automated CIP improves quality of product

Advances in sanitizing:

- **Cut cleaning costs**
- **Cut waste disposal costs**
- **Replace unskilled janitor labor with technicians**

By C. R. JOHNSON
Plant Manager
Baker Laboratories, Inc.

ALL canned milks are, of course, sterile. Any bacteria originally present in the milk have been killed during processing. What is usually lost sight of is that bacteria are only killed, not removed from the milk.

While in most cases this is unimportant, some infants with delicate digestive systems may react unfavorably to large numbers of dead bacteria. This sensitivity may account for the unexplained minor digestive upsets encountered when using canned milks.

At Baker Laboratories, Inc., it has been major policy for years to keep bacteria count as low as possible with respect to both, active and dead cells.

Toward this end, we start by buying only first class raw materials—Grade A skim milk with a count no higher than 200,000/ml.

Raw product is delivered by tank truck and is pumped to storage tank for holding until analyzed for bacteria and also protein. Protein analysis serves as guide in formulation of the fortified skim milk.

To check product in process, we have four technicians in our quality control laboratory making counts every day from six different points in our process.

Keeping the count low is, to a great extent of course, a matter of maintaining a high standard of sanitation; setting up a cleaning procedure that will do the job at all times, and then eliminating any possibility of human error in the cleaning process.

Switching from take-down to manual CIP satisfied the first objective; however, it did not eliminate the human element. Consequently, cleaning procedures still were not exactly the same for two consecutive days and quality still fluctuated somewhat.

The next logical step was eliminating the human element from cleaning as much as possible by switching from manual to automated CIP.

To accomplish this, process piping system was divided into three cleaning circuits with addition of a fourth at a later date for spray cleaning tank trucks.

Originating from a central control room where cleaning pump, make-up tank, cleaning and sanitizing solutions, and controls are located, supply-return lines to these four circuits are as follows:

Circuit No. 1 includes single raw-product storage tank, four finished-product tanks plus tank truck. A tank cleaning cycle is used on this circuit.

Circuit No. 2 applies a line-cleaning cycle to all receiving lines and tank-truck unloading pump and its hose. Also included in this circuit are product lines on second floor which carry hot milk to evaporators. (Evaporators are CIP cleaned under manual control.)

Circuit No. 3 also uses a line cleaning cycle to clean all lines in the standardizing area, all product lines leading to holding tanks and all lines from tanks to filler, but not filler.

Circuit No. 4 includes production lines from evaporators, two homogenizers, plate heat exchanger and carbohydrate lines.

To clean any circuit, operator need only make proper supply-return connections, turn selector switch to appropriate position and press button, see photo center right. To clean any of the tanks in circuit No. 1, connection to desired tank is made at Cleaning Hook-Up Station, see photo lower right.

Compression valves in product lines are partially opened (1½ turns from full open) so they too will be cleaned.

Changing the selector switch to different positions automatically provides different cleaning cycles for each circuit.

While each cycle is somewhat different in regard to such variable as time, temperature, detergents and number of rinses, there are only two basically different cycles, one being for tanks (spray cleaning) and one for piping and process equipment other than tanks (line cleaning).

Main difference is the pump operation which provides a series of burst pre-rinses and post-rinses when spray cleaning tanks. Pump operates continuously on line circuits.

Method by which single make-up tank is used also varies according to type of cycle, see drawing. Bypass technique limits solution requirements to filling supply and return lines and covering outlet valve on tank being cleaned.

Thus, 10,000 gal tanks can be cleaned as far as three floors away from circulating pump with as little as 60 gal of solution in circuit.

All functions of automated cleaning process, with exception of aforementioned supply-return connections, are controlled by the timed program controller.

Once set, controller will open and close appropriate valves in solution lines, make-up tank, drain and steam line; it will start and stop circulating pump, add alkali, water conditioner, acid or chlorine, all at the appropriate moment for the necessary length of time. (For diagram and description of timed program controller see next page.)

At this plant, our regular cleaning cycle consists of the following: cold rinse, tempered rinse, circulate hypochloride, circulate chlorinated-alkaline solution, cold fresh rinse and acidified rinse.

Our overriding or alternate cycle, which we use on Wednesdays, is as follows: cold rinse, tempered rinse, wash with acid solution, circulate caustic strong enough to neutralize acid and bring pH up to 12, warm rinse, and cold rinse.

Velocity of cleaning fluids is 9 to 12 fps at a pressure of about 56 psi. Lines are pitched for gravity drainage and flow in split circuits is controlled by restrictors in line so that nothing is left to the worker.

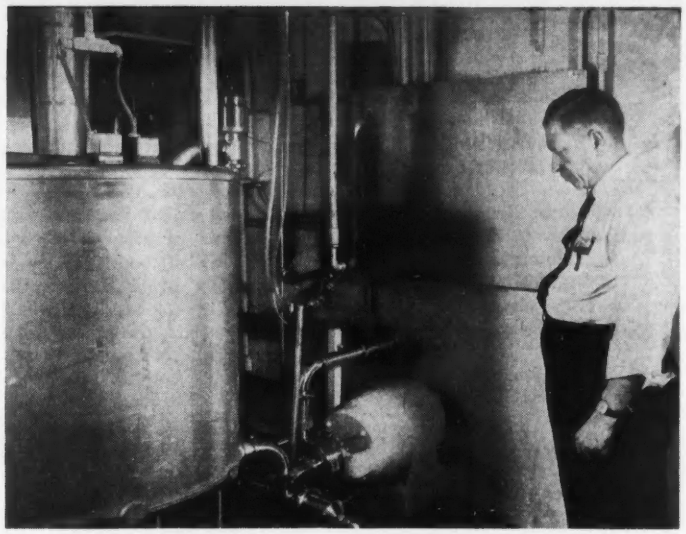
With automated CIP, and almost complete removal of human element, we have been able to cut total bacteria count by 53 per cent (count at filler now is 350 to 500/ml).

To next page

Process control is by Flex-O-Timer® Timed Program Controller, made by Taylor Instrument Companies, Rochester, N.Y.
7461 on Reader Service Slip.

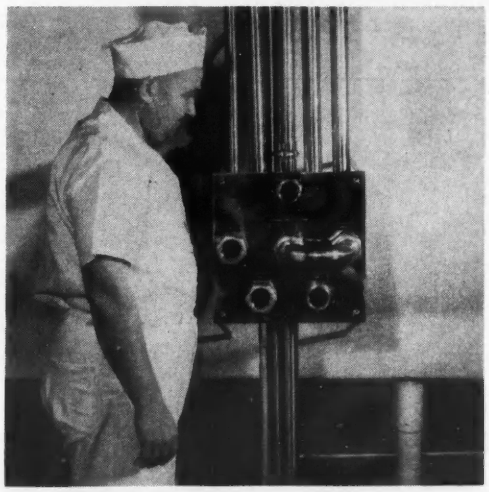
Adaptation of instrument for in-place cleaning was worked out by Dale A. Seiberling, Engineering Consultant, Klenzade Products, Inc., Beloit, Wis.
7462 on Reader Service Slip.

Automatic two- and three-way valves, as well as compression valves, were furnished by the Ladish Company, Tri-Clover Division, Kenosha, Wis.
7463 on Reader Service Slip.



"Heart" of CIP system is this centrifugal pump which circulates rinses or detergents as called for by programmed cleaning cycle. Panel behind and above pump is back of program controller and temperature-recorder

"Brain" of automated CIP is this program controller which opens and closes valves, starts and stops pumps, all according to predetermined sequence and for predetermined time interval. Operator merely dials cleaning selector switch to desired position and presses starter button. Temperature controller-recorder is at right



Various product tanks are connected to cleaning circuit at this cleaning Hook-Up Station. Operator need only connect 180° ell to appropriate line leading to tank scheduled for cleaning. Hex-nuts on nipples indicate full tanks; they avoid possible error of pumping cleaning solution into product

CIP improves quality *continued*

Our maximum variation from one day to the next has been reduced from a high of 110 per cent to 15 per cent.

Labor required for the job was cut from 42 manhours per day to 20 manhours when we switched from take-down to manual CIP, and has now been reduced to 4½ manhours. Further, since chemicals are now added automatically, cleaning-material costs have been reduced by 5½ per cent.

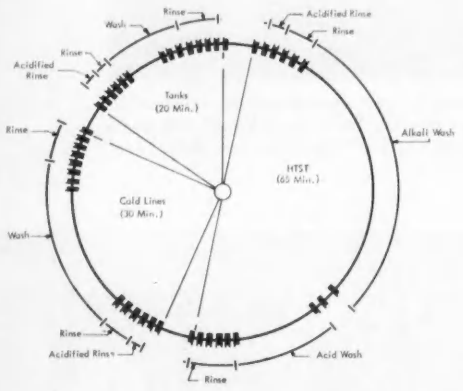
A bonus which has come our way as a result of automated cleaning has been reduced waste disposal cost. Our gallons of effluent have been cut by 40 per cent and our pounds of BOD by 37 per cent.

Cost of providing for disposal of this effluent dropped, as a result, from $14,000 to $6500; monthly operating charges dropped from $75 to $40.

From tangible benefits, the system has payed for itself in 18 months. It has persuaded us to automate the production process.

An intangible benefit accruing from our CIP system stems from the fact that old clean-up methods required workmen to be janitors who spent much time in water. It was our experience that this usually kept high-quality workmen out of a dairy plant.

Now, however, personnel in charge of operating the automated CIP system consider themselves technicians and are quite concerned with sanitary procedures and results obtained.



Timing dial as it might be set for typical automated CIP process.

Three different cleaning cycles for three cleaning circuits are programmed on this one dial: cold-line cleaning (30-min cycle), tank cleaning (20-min cycle) and HTST pasteurization equipment cleaning (65-min cycle)

Automatically controls sequence, duration of CIP functions

INSTRUMENT is a timer which, according to a predetermined program, turns electrically or pneumatically operated process functions on or off.

To accomplish time measuring and process actuating, instrument consists of two basic sections: timing dial driven by a synchronous motor and process actuating components.

Trip pins on timing dial cause a step motor to rotate a horizontal shaft 15°. Up to twelve different switches can be opened or closed during each 15° rotation.

This action can occur up to 20 times for each cycle of the timing dial.

In addition, trip pins provide automatic return to start position.

Major components of second section — the process actuating mechanism — are cog wheels or step discs. There is also a step motor which, through a gear train rotates the step discs, and a timing switch for starting and stopping the step motor.

As time dial of controller turns, trip pins on its periphery activate the timing switch, causing step motor to rotate horizontal shaft and series of step discs mounted on it for 15° increments (see X in diagram lower left).

During rotation of step shaft, one slot on each step disc passes beneath trip mechanism of electric switches and air valves. Trip pin, bolted in slot of step disc, will trigger mechanism to open or close approximately in middle of 15° rotational motion.

Slots on discs are numbered to coincide with minute marks on timing dial. Therefore, any function can be turned on or off at any time by simple bolting a trip pin into slot that corresponds to the desired time, of the step disc which corresponds to the desired function.

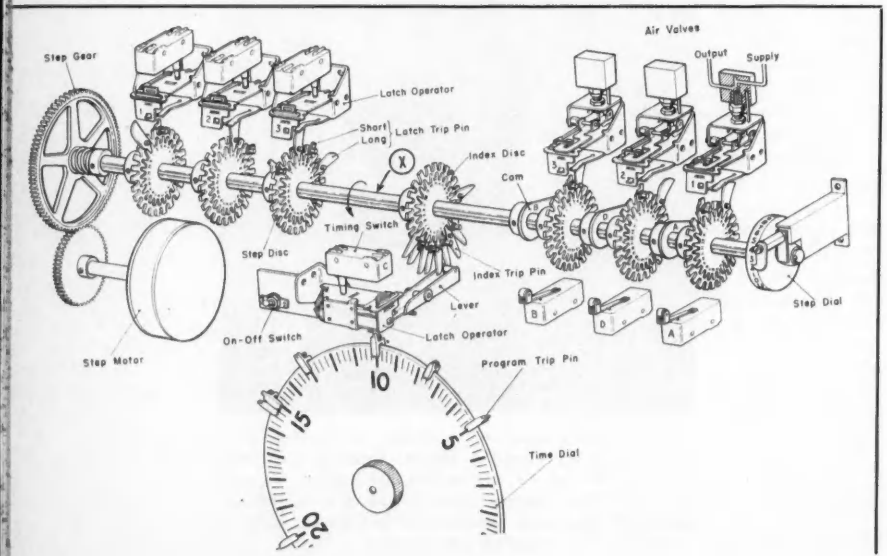
Since step discs have 20 slots, up to 20 "on" or "off" (short or long) trip pins can be used. Functions can thus be started or stopped 20 times during one cycle or one complete revolution.

Controller can accommodate up to twelve electric switches or air valves, or any combination thereof; can therefore command up to twelve different functions.

Program trip pins on perphery of dial control the "when" of any process steps. They can be secured to dial at any desired point. Operations can be actuated in as short as 7½-second time interval.

Time dials of 15-, 30-, 60-, 120- and 240-minute duration can be used, depending upon length of process.

At Baker Laboratories, each of the four circuits has its own cleaning cycle but all four cycles are programmed



When starter button is pressed, continuous rotation of timing dial starts. Prongs of program trip pins trip latch operator of timing switch, thus closing circuit to start step motor and thereby start 15° rotation of shaft and step discs.

Latch trip pins on step discs actuate appropriate functions necessary for first step of cycle.

Index disc, mounted above lever of timing switch, has trip pins so set that when 15 degrees of rotation are completed, it will trip this lever to open electrical circuit to stop step motor and step-disc shaft.

Time dial continues to rotate. As next program trip pin on dial unlatches timing switch, step motor is again started. Process repeats itself with same and/or other process functions now being actuated (or turned off) by trip pins located in various spaces around periphery of step discs.

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on single timing dial.

Instrument has separate step discs to control water valve, drain valve, steam valve, circulating pump and chlorine, acid and alkali metering pump.

In order to program the four cycles on single timing dial, two step discs are used for circulating pump since pump must run intermittently for tank cleaning and continuously for line cleaning. Cycle selector switch determines which step disc is in operation.

In addition, function of step disc for additive pump is switched, as for example from chlorine to alkali metering pump, depending upon which circuit on timing dial is in progress. This switching is also made by selector switch.

Naturally, care must be taken in planning more than one cycle on single timing disc in order that function of step disc that is switched will always occur at same time and for same duration.

Typical Cycle

For line cleaning with chlorinated alkali detergent and chlorine rinse, typical programmed cycle, lasting about 30 minutes, would be as follows: at start or zero time, water valve is opened.

After one minute, circulating pump starts; after five minutes, drain valve and water valve closes, and chlorine pump starts.

At six-minute mark, chlorine metering pump stops and steam valve opens. After seven minutes of cycle has elapsed, alkali and water conditioner metering pumps start and run for approximately one minute (till after eight-minute mark). Detergent solution is now recirculated for 14 minutes.

After 21 minutes, steam valve shuts off; after 22 minutes, drain opens and after 23 minutes, water valve again opens. It stays open till after 28-minute mark when it closes, drain valve opens and chlorine or acid metering pump starts (dependent upon desired final rinse treatment).

Metering pump shuts down after 29-minute mark; drain opens after 30-minute mark as circulating pump is shut off. END

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Compiles papers on texture in foods

A group of papers on texture in foods, presented at a symposium organized by the Food Group in London, England, have been compiled into a hard cover book.

Topics covered in collection of papers include perception in the mouth, foods of simple structure, emulsions and related dispersions, gels, texture in bread and flour confectionery, measurement of meat tenderness, texture changes in fish and its measurement and texture in cooked potatoes.

Papers also provide information on scientific principles in relation to instrumental measurement of textural properties, effect of chemical constitution on texture of peas and a discussion of the strength of eggs.

("Texture in Foods," 184 pages, is available for $5.00 from The Macmillan Company, 60 Fifth Ave., New York 11, N. Y.)

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A book, the tenth volume of a series, contains all papers presented at the 1959 Plant Maintenance & Engineering Conference. It is designed as a permanent, up to date record of advances in the field.

A vast number of practical situations are covered. Also included are answers to questions submitted by engineers attending the conference as well as more than 70 charts, graphs and diagrams.

("Techniques of Plant Maintenance & Engineering," 266 pp, may be obtained by sending $10 to Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.)

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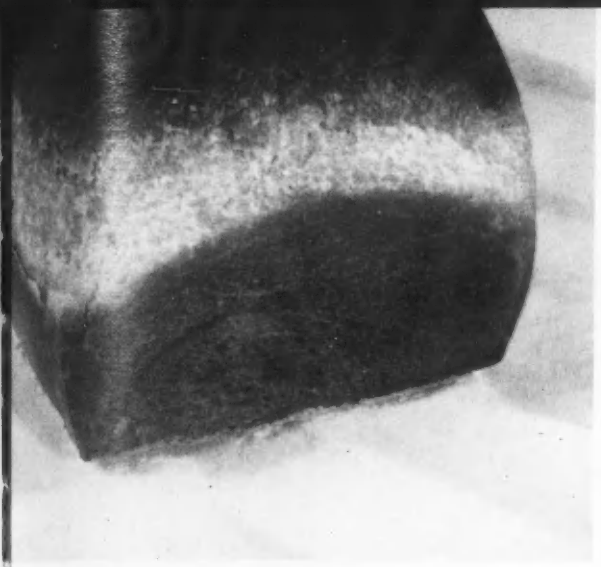

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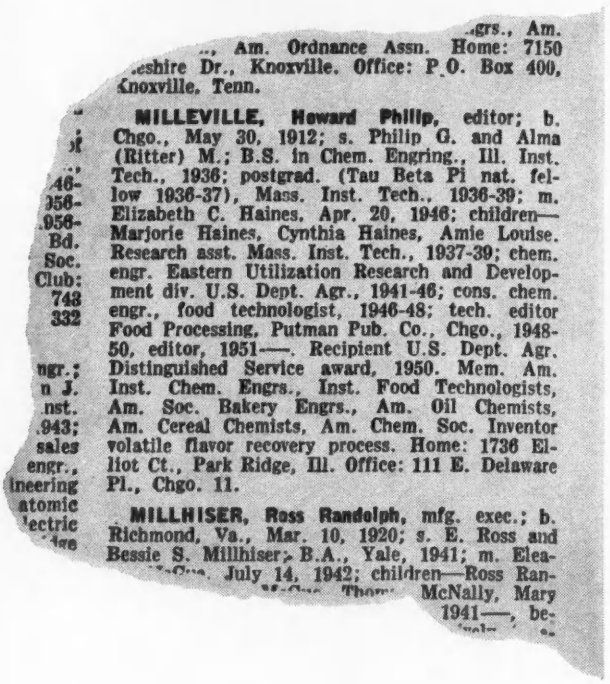

...grs., Am. ..., Am. Ordnance Assn. Home: 7150 ...eshire Dr., Knoxville. Office: P.O. Box 400, Knoxville, Tenn.

MILLEVILLE, Howard Philip, editor; b. Chgo., May 30, 1912; s. Philip G. and Alma (Ritter) M.; B.S. in Chem. Engring., Ill. Inst. Tech., 1936; postgrad. (Tau Beta Pi nat. fellow 1936-37), Mass. Inst. Tech., 1936-39; m. Elizabeth C. Haines, Apr. 20, 1946; children—Marjorie Haines, Cynthia Haines, Amie Louise. Research asst. Mass. Inst. Tech., 1937-39; chem. engr. Eastern Utilization Research and Development div. U.S. Dept. Agr., 1941-46; cons. chem. engr., food technologist, 1946-48; tech. editor Food Processing, Putman Pub. Co., Chgo., 1948-50, editor, 1951—. Recipient U.S. Dept. Agr. Distinguished Service award, 1950. Mem. Am. Inst. Chem. Engrs., Inst. Food Technologists, Am. Soc. Bakery Engrs., Am. Oil Chemists, Am. Cereal Chemists, Am. Chem. Soc. Inventor volatile flavor recovery process. Home: 1736 Elliot Ct., Park Ridge, Ill. Office: 111 E. Delaware Pl., Chgo. 11.

MILLHISER, Ross Randolph, mfg. exec.; b. Richmond, Va., Mar. 10, 1920; s. E. Ross and Bessie S. Millhiser; B.A., Yale, 1941; m. Elea... July 14, 1942; children—Ross Ran... McNally, Mary ... 1941—, be...

HOWARD P. MILLEVILLE

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Color in cured meats

Production of pink color in cured meat by use of nitrate as a source of nitrite for a curing agent has been a common practice since the Middle Ages.

This booklet presents a comprehensive summarization of information that has been developed on this subject to date. It discusses the chemistry of meat pigments and the changes that take place during curing. Material is provided on a semi-technical plane for easier understanding.

Summation is made of the problems that still are not fully understood and point to further research. Two pages of references are included in the work.

("The Pigment of Cured Meats", AMIF Bulletin 41, by Dr. J. B. Fox, Jr., associate biochemist in the Division of Biochemistry and Nutrition, AMIF, 18 pp, is available from H. A. Armstrong, Chief of Information and Service, American Meat Institute Foundation, 939 E. 57th St., Chicago 37, Ill.)

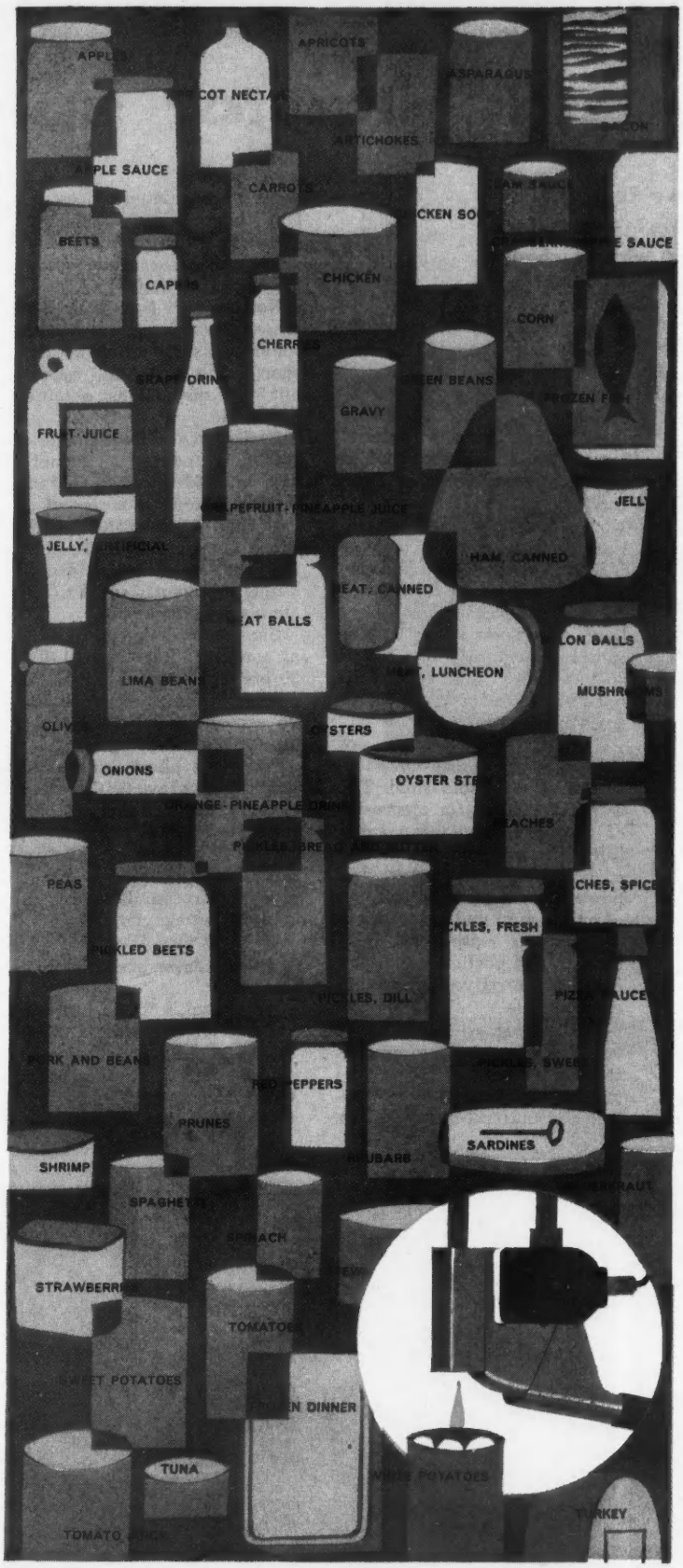
Collection of papers on quality control of food

A series of papers on quality control of food are compiled in 176-page, hard cover book. Papers were presented at a symposium organized by the Food Group and Association of Public Analysts in London, England.

Topics covered in the 16 papers, presented in four sessions, include quality control of chocolate, confectionery, milk and milk products, fish products, biscuits, bread and other bakery foods, as well as various meat products.

Papers also discuss standards of quality of canned fruits and vegetables, the automatic control of proportioning and mixing, the factory manager's aspect and the quality control of food by sensory assessment.

("Quality Control of Food," 176 pages, is available for $4.00 from The Macmillan Company, 60 Fifth Ave., New York 11, N. Y.)



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Versatile Flocron dispenser ends costly ingredient loss for 63 different products!

Companies who pack, process or can everything from apple sauce and pickled beets to chicken soup and canned meats report substantial ingredient savings since using the new Flocron liquid dispenser. For the amazing Flocron avoids waste inherent in "overflow fill" systems, stops "splash loss" and dispenses more than forty different ingredients with speed and pin-point accuracy that saves money.

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No need to revise production lines. The Flocron can be operated with existing equipment. Scientific Dispensing Company technicians are available in all areas to assist with installation and service problems.

Some of the liquids you can dispense with the Flocron include: ascorbic acid, beef gravy, brine, concentrated syrup, hot butter, Monosodium Glutamate, spice oils, sugar and brine, tomato puree and vinegar.

For a complete list of ingredients the Flocron dispenses and for additional information about the Flocron itself write:

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Longer storage life for spices

Spices, encapsulated in a protective coating, have greater stability, are easily dispersible in liquids, form stable emulsions and may be used without change in product formulation

FP STAFF

Based on information obtained from
Robert T. Maleeny, Chief Chemist
Dry Materials Division
Dodge & Olcott, Inc.

NEW form of dry seasonings, which may be stored longer without significant loss of flavor, are available from the Dry Materials Division of Dodge & Olcott, Inc., Hawthorne, N. J.

Known as Spisoseals, seasonings have been formulated so they can be used as alternates for crude spices or dry solubles. Generally, one pound will replace an equivalent quantity of corresponding spice or dry soluble.

Flavoring components of Spisoseals are encapsulated in a protective colloid shell. The essential oils and/or oleoresins of the spice have been carefully blended with a dry base such as dextrose or salt, dispersed into a colloidal solution of edible gum and spray dried.

As water evaporates from the sprayed particles, the gum forms a protective film around each particle.

This protective coating prevents oils from evaporating as well as having access to oxygen which might have deleterious effects upon flavors. Thus, these encapsulated spices retain flavor longer and have greater flavor stability than dry solubles or crude spices. (See Tables I and II)

Not only are Spisoseals easily dispersible in all water solutions, such as milk, vinegar, brine, wine and syrups, but the dispersions obtained are stable.

Each spray-dried particle of seasoning, having a diameter of about 150 microns, contains several minute globules of oil less than 15 microns in size. When gum coating is dissolved and the oil released, droplet size is sufficiently small to create a stable dispersion.

Samples dispersed in water at concentrations from 0.10 to 30 per cent and examined periodically for 90 days, showed no separation of oil phase in any of the samples.

This is a phenomena which may prove of particular interest to pickle packers. For it would eliminate the need to violently agitate essential oil mixtures to create a dispersion or an emulsion or use solubilizing agents.

Other flavor comparisons

As shown in Table I, ground spices have been found to lose flavor rapidly. Whole crude spices, on the other hand, could be expected to be fairly retentive of volatiles. In grinding, the protective cell walls are ruptured, thereby exposing the oils to the atmosphere.

How would this effect development of flavor levels for crude spices as compared with Spisoseals?

Solutions of equivalent quantities of crude spices, Spisoseals and dry solubles were evaluated organoleptically. Flavor level of Spisoseals and dry solubles reached maximum immediately upon preparation of solution.

Most crude spices developed full flavor within 48 hours.

Samples were kept in sealed bottles for one week. Once flavor maximum was obtained, it kept indefinitely under test conditions.

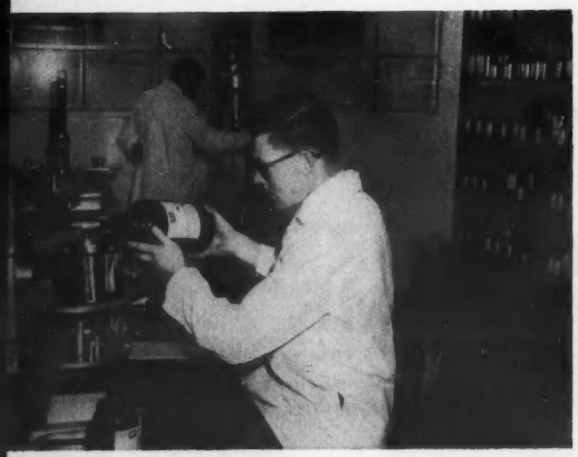
Since the gum coating surrounding Spisoseals disintegrates rapidly, maximum flavor intensity is produced almost immediately upon being wetted.

In the ground crude spice, however, part of the flavoring constituents are trapped by the semi-porous cell walls and is not of flavor value until it has been leached out.

The length of time necessary to develop full flavor from crude spice is a variable which depends upon such factors as concentration of the solution, the extracting solvent and the number of cells ruptured by grinding.

7469 on Reader Service Slip.

Photos below show three steps in manufacture of Spisoseals. At left, oil and/or oleoresins of spices are being weighed out. Following this, they are carefully blended with a dry base such as dextrose or salt in a blender as shown in center. They are then dispersed into a colloidal solution of edible gum and spray-dried in spray dryers similar to lab units shown at right



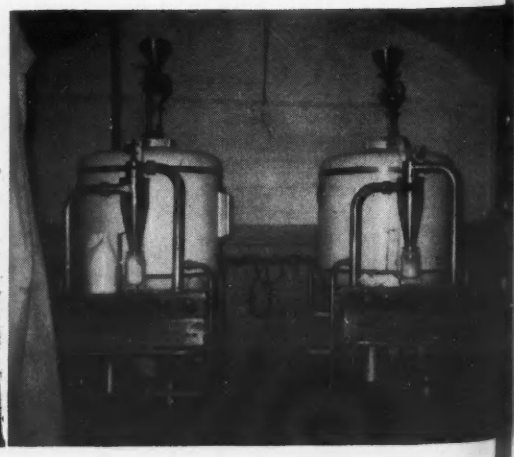


Table I — Flavor Retention (Quantitative Measure of Total Loss of Volatiles After 60 Days)

Material	Per cent Loss of Total Volatiles after 60 days
Spisoseal Allspice	2.1
Dry Soluble Allspice	39.3
Ground Allspice	36.5
Spisoseal Basil	3.4
Dry Soluble Basil	58.3
Ground Basil	62.4
Spisoseal Celery	2.2
Dry Soluble Celery	42.8
Ground Celery	27.8
Spisoseal Pepper, Black	2.8
Dry Soluble Pepper	46.7
Ground Pepper, Black	38.5
Spisoseal Nutmeg	2.4
Dry Soluble Nutmeg	58.6
Ground Nutmeg	54.6

Comparative flavor retention (loss of total volatiles) for Spisoseals, dry solubles and crude spices are shown in above table.

Each of the three forms of spices were analyzed for volatile oils immediately after manufacture and at various times thereafter over a period of 60 days.

Loss of Flavor in Spisoseals at the end of the 60 day storage period amounted to less than four per cent in all cases and less than three per-cent in the majority of sample tests. Average loss was 2.7 per cent.

Small loss, which did occur, is the result of mechanical breakage of some of the particles with subsequent exposure and loss of volatiles.

Note extremely high loss of the volatile constituents of tested dry solubles, which averaged almost 50 per cent loss, and the ground crude spices, which were found to average a loss of over 40 per cent.

Table II — Flavor Stability (Qualitative Organoleptic Evaluation of Spices and Finished Products Containing Spices)

Material	Days			
	0	1	30	365
Spisoseal Basil	10	10	10	10
Dry Soluble Basil	10	8	7	4
Ground Basil (40 mesh)	10	9	6	5
Spisoseal Celery	10	10	10	10
Dry Soluble Celery	10	9	7	5
Ground Celery (40 mesh)	10	9	6	6
Spisoseal Caraway	10	10	10	10
Dry Soluble Caraway	10	8	6	3
Ground Caraway (40 mesh)	10	8	5	5
Spisoseal Dill	10	10	10	10
Dry Soluble Dill	10	8	5	3
Ground Dill (40 mesh)	10	8	4	4
Spisoseal Ginger	10	10	10	10
Dry Soluble Ginger	10	10	8	7
Ground Ginger (40 mesh)	10	10	8	7

Results of flavor stability tests are shown in above table.

In the tests, samples of Spisoseals were subjected to organoleptic evaluation immediately after manufacture and at stated intervals as shown thereafter. Samples of comparable dry solubles and crude spices were also included in the tests.

Evaluation was made of finished products containing the seasoning agents as well as of the crude spice, dry soluble or Spisoseal.

Ratings given to the seasoning agents and products were based on a ten unit scale. Ten was considered optimum flavor character and anything in the range of four to nine was acceptable.

No attempt was made to estimate the strength of the flavor, although differences in strength became quite apparent during the test.

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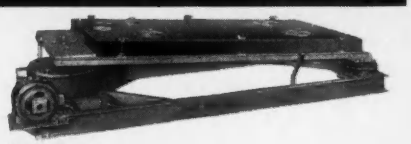
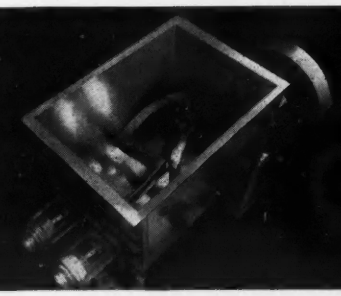
with super-active ball cleaners, lead the field for fast, thorough sifting of wet or dry ingredients. Models for 2, 3, 4, or 5 separations. Often combined with DAY regulating feed hoppers and material conveying equipment.



Used for:
Flours; sugar; salt; dry milk; cocoa; corn products; starch products; seasoning; cottonseed & soybean meal; semolina; candy; prepared mixes; chewing gum; powdered eggs; soup products; animal feeds; tobacco, etc.



DAY DOUBLE-ARM MIXERS

are made in various capacities and models to meet every requirement for light, medium and heavy-duty kneading and mixing. They give fast, thorough dispersions and are the choice of leading food processors.

Used for:
Confectionery products; mixed meats; chocolate; cake mixes; icing; dog food; shredded fish products, etc.

DAY also builds a wide range of other equipment, such as mechanical and airmatic materials conveying systems; homogenizers; hoppers and scales; 3-roll dispersion mills; water coolers, etc. When you select DAY, you choose equipment preferred and proved in thousands of the nation's leading food processing plants. Call in a DAY field engineer, or write direct, for detailed information on your equipment requirements.

The J. H. DAY Co.

Division of The Cleveland Automatic Machine Co.

Quality Mixing, Blending, Milling and Sifting Machines since 1887

4940 Beech Street, Cincinnati 12, Ohio

7470 on Reader Service Slip.

DIAMOND CRYSTAL SALT HAS THE GRADE YOU NEED.

Because the quality and grade of salt used in food products makes a significant difference in the end-result, Diamond Crystal has a specific salt for any specific need—each of the highest uniform purity.

Diamond Crystal Salt combats danger of spoilage, enhances and improves the taste of your product. The presence of calcium and magnesium in a less pure salt could form unappetizing scums and discolorations in some canning processes. In other types of foods, copper and iron in the salt could foster oxidative rancidity, especially in foods containing fats and oils.

All salt is not alike. Diamond Crystal's exclusive Alberger process produces a flake-type salt that is 99.95% pure. This high purity eliminates salt bitterness, thus resulting in best flavor development of your product.

Diamond Crystal Salt Co.'s staff of trained food specialists are available to assist you in selecting the correct grade or type salt for your product. For more information, call the nearest Diamond Crystal sales office or write to Diamond Crystal Salt Co., St. Clair, Michigan.

Diamond Crystal Salt Co.
ST. CLAIR, MICHIGAN

Sales Offices: Akron • Atlanta • Boston • Charlotte
Chicago • Detroit • Louisville
Minneapolis • New Orleans • New York

Plants: Akron, Ohio • Jefferson Island, Louisiana
St. Clair, Michigan

7471 on Reader Service Slip.

How to use milk sugar in your products

The use of Lactose milk sugar in your products is subject of 30-page brochure available from Western Condensing Company. Applications for many products include discussion of how you can use in modified or fortified skim milk, buttermilk, chocolate drink, orange and other fruit drinks, cottage cheese, frozen desserts, etc.

Each use is indexed for easy reference and includes a general discussion of the particular use as well as example and advantages.

As a flavor booster, milk sugar absorbs and projects essential flavors. It is low in sweetness, being 1/6th as sweet as Sucrose and 1/3 as sweet as Dextrose. Free-flowing product is completely soluble. It does not pick up moisture readily and will not cake or lump.

Because of crystallization control, milk sugar alters the behavior of other sugars. Its pigment absorbing properties extend and maintain even color dispersion. And as a fermentation agent, it insures proper culture performance.

7472 on Reader Service Slip.

Replacement for beef extract

A replacement for beef extract, available in both paste and powder form, is described in 2-page bulletin. Bulletin on "A New and Improved Replacement for Beef Extract", as well as samples of the product, are available from Vico Products Co.

Beef extract flavor is obtained by carefully combining the hydrolysates of corn, wheat and a special strain of yeast.

Resultant vegetable protein hydrolysate blend may be used in such products as beef pies, bouillon cubes, cooking sauces, corned beef hash, frozen foods, hamburger, meat gravies and gravy mixes, prepared meat products, seasoning com-

(*Continued on page 48*)

that's interesting

Mail-order meat

Montgomery Ward and Wilson now are offering quality frozen meats, poultry and prepared meals to consumers via mail order. Special food catalog features Wilson beef, pork, lamb, chicken, turkey and prepared meals

known as "Menu - Paks" — top-quality portion - controlled foods previously available only to hotels, restaurants and institutions.

All orders (minimum order, 25 lb) will be processed quickly and shipped to homes via Railway Express in sturdy containers. The meat is sealed in moistureproof, airtight wrapping materials and packed in dry ice. Delivery to consumer is on a "satisfaction guaranteed" basis.

For more information on product at right, circle 7473 see information request blank opposite last page.

LACTOSE...
ADDS A MAGIC TOUCH TO
EVERY TYPE OF FOOD PRODUCT!

Regardless of what type of food items you produce, you are certain to find ways of improving their appetite appeal with Lactose.

Among its many valuable properties, this amazing milk sugar enhances flavor, absorbs and holds color in foods, preserves aroma and aids proper browning and carmelization.

Only Western can supply Lactose in the full range of particle sizes required by various food applications. Strict chemical and bacteriological specifications, rigid quality control and years of processing experience assure highest quality.

Take a good look at Lactose. Send for the facts and figures today. For complete information, prices, product samples and bulletins on Lactose, write our Technical Service, Department 17F. Be sure to tell us about the applications you're considering.

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Lactose—Pure Milk Sugar

add
nutrition-flavor
sales appeal
to your product with
Lake States® (U.S.P.)
or Bakon® (hickory-smoked)
Torula Yeast

Which will spark more sales of your product... *flavor or nutrition?* Lake States offers you a choice of two ingredients: nutritional U.S.P. Dried Torula Yeast and flavorful hickory-smoked Bakon Yeast. At economical cost, Lake States can help you boost your share of the market with a *new* or *improved* product.

LOW COST NUTRITION WITH TORULA YEAST

If your product already possesses a desirable taste, you can increase sales at low cost by adding Lake States Torula Yeast as a nutritional ingredient. Many food and drug manufacturers already use Torula either as an ingredient or as a base to attain a higher nutritional level in their products. Some examples: baby foods, institutional foods, seasoning blends, pharmaceuticals.

Your product can reap the sales value of important nutritional factors with Lake States Torula Yeast. Torula is high in protein (50% minimum), a rich source of lysine and all the amino acids of meat; Torula is a reliable source of the entire vitamin B complex, also containing essential minerals such as calcium, iron, phosphorus and iodine.

Food technologists appreciate the fact that Lake States Torula Yeast is produced from sterile media under vigorous and constant quality control. Thus, Torula is noted for its purity, uniformity, stability and long shelf life. Torula blends well with most products and is bland in flavor.

EXCEPTIONAL FLAVOR WITH BAKON YEAST

Perhaps the strongest sales appeal of your product is taste. If you would like to enhance your product's flavor, or if your product needs a new taste, consider the genuine hickory-smoked flavor of Bakon Yeast. A number of leading food processors have found hickory-smoked Bakon Yeast an ideal flavoring ingredient (and high in nutrition, too) for their products. Examples: baby foods, cheeses, spreads, nibbling foods, crackers, stews and vegetables, soups, spice mixes and seasoning blends. Taste tests have disclosed Bakon Yeast to be superior to even a natural bacon flavor.

DUAL VALUE OF BAKON YEAST IN MARKETING A PRODUCT

Bakon Yeast is 100% hickory-smoked Dried Torula Yeast U.S.P. and as such contains all the nutritional values of Torula. This presents your product with a *double value* which your marketing experts can put to optimum advantage: flavor plus.

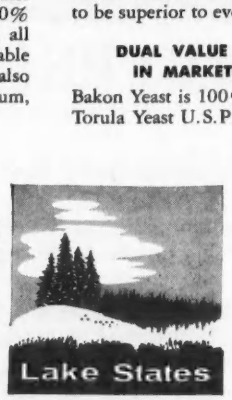
Bakon Yeast, Inc., the original producer of smoked yeast, has joined Lake States, America's pioneer and leading producer of Torula Yeast. With expanded production facilities at Rhinelander, Wisconsin Bakon customers are assured prompt delivery from fresh stock. Nutrition from one low cost ingredient... Bakon Yeast. If yours is a specialty product, consider the fact that Bakon Yeast is salt-free and contains no starch, sugar, meat or meat extract; Bakon meets requirements for low sodium diets. Furthermore, Bakon Yeast is stable, uniform, and conforms to all FDA regulations.

YOUR BEST PROOF

The most convincing facts on the advantages of incorporating either Torula Yeast or Bakon Yeast in your product is the aggregate of food and drug firms which are now marketing Bakon-flavored or Torula-enriched products. But make your own test. Send for complimentary test samples (specifying Lake States Torula or Bakon Yeast) to Lake States, Dept. FP.

TORULA *gives your product vital nutrition to increase sales.*

BAKON *gives your product an exciting bacon-like taste plus nutrition for greater sales appeal.*



Lake States

LAKE STATES YEAST AND CHEMICAL DIVISION OF ST. REGIS PAPER COMPANY
RHINELANDER, WISCONSIN
SALES OFFICE: 420 Lexington Ave., New York 17, N.Y. or W. Glenn Wunderly Company, 232 North Lake Avenue, Pasadena, California; Dillons Chemical Company, Ltd., Montreal and Toronto, Canada

7474 on Reader Service Slip.

(*Continued from page 46*)

pounds, soups, stews and many other foods.

Paste, which may be used as a direct replacement for beef extract, is a solid product at room temperature which does not have to be heated to remove from container. This feature prevents loss of any flavor from heating.

It can be processed in present equipment without change in operations.

Powdered product replaces beef extract in dry formulations, eliminating additional drying steps and extra handling. It is available in a variety of granulations — coarse, medium and fine, as well as according to customers' mesh specifications.

Typical analysis is as follows:

	Paste	Powder
Total Solids	83.0%	98.0%
Ash	43.8	50.5
Organic Solids	39.2	47.5
Sodium Chloride	41.0	47.0
Total Nitrogen	5.25	5.60
Protein (N x 6.25)	32.8	35.0
MSG	11.5	13.2
Ammonium Chloride	2.79	3.14
pH	5.2	5.2

7475 on Reader Service Slip.

Annatto colors available to replace non-certified coal tar colors

Two food colors, containing annatto color in a vegetable oil base, may be used to replace coal tar yellows #3 and #4 which, according to a government ruling, are no longer certifiable.

Because the annatto colors are oil soluble, they have wide range application in foods containing fat or oil as an ingredient. They may be dissolved in oil, or added directly to products in which they are to be used.

These annatto colors will dissolve with a minimum of heat and agitation in all foods containing fat.

One of the colors, A-500, is a pure extract of annatto seed. It imparts a yellow to orange-red hue, depending upon the product with which it is used

and the amount of color introduced.

This color may be used in process cheese as well as in shortenings, salad oils, bakery products and many other foods.

The other natural vegetable color, AT-250, contains annatto and turmeric. It imparts a deep butter-yellow color which makes it particularly suitable as a colorant for margarine.

Both products are available in solid form, either in bulk, custom packaging or in two-ounce "scored" bars to facilitate measuring. Colors may also be supplied in carriers ranging from fluid oil to hardened fats on special order.

Supplier: Chr. Hansen's Laboratory, 9015 W. Maple St., Milwaukee, Wis.

7476 on Reader Service Slip.

Using sorbic acid as a food preservative

Improved sorbic acid for use as a preservative in wines, cheeses, bakery foods, salads, citrus fruits, meat products, pickles, syrups, tomato products and many other foods is subject of 16-page brochure on "Sorbic — The Modern Food Preservative."

Published by Union Carbide Chemicals Co., Div. of Union Carbide Corp., brochure outlines many improvements which have been made in sorbic acid. It is now a white, free-flowing product with little odor to affect the flavor or aroma of foods. Water content is uniform and has been reduced to less than 0.5 per cent by weight. It also has better color stability and improved storage stability.

Both sorbic acid and potassium sorbate appeared in the lists of substances "generally recognized as safe" for use as chemical preservatives in foods (*Federal Register*, Nov., 20, 1959). Sorbic acid has also appeared on the list of substances for which prior "sanction" has been granted by FDA for "use as an antimycotic in the manufacture of food-packaging materials"

GET RESULTS WITH KRAFEN

If you use a dairy ingredient in manufacturing baked goods, frozen foods, dry mixes, sauces, processed foods, confections or ice cream, replace it with Krafen and . . .

Bring Out Flavor normally masked by high protein levels in other dairy ingredients. The milk sugars in Krafen allow flavor to come through stronger. This means that frozen food manufacturers, for example, save substantially on the use of expensive seasonings.

Extend Shelf Life of your baked goods by a profitable margin due to Krafen's unusually high moisture-retaining properties.

Improve Texture of your piecrusts—get a flakier, more tender crust free from sogginess.

Save up to 5¢ a Pound on dairy solid costs by using Krafen—and still be assured that you're using a superior replacement for your present ingredient. For Krafen is a high-quality, low-bacteria dairy ingredient produced by Kraft under conditions of maximum sanitation in one of the world's largest whey plants. Why not experiment with Krafen in your *new* products as well as *present* products. Send for your free test sample today.

MAIL THIS COUPON FOR FREE SAMPLE OF KRAFEN

KRAFT

KRAFT FOODS INDUSTRIAL DIVISION, Chicago 90, Ill.

Gentlemen: I would like to test KRAFEN in my products. Please:

☐ **Send me a free sample as well as latest data on KRAFEN, your improved spray-dried sweet whey.**

☐ **Have a Kraft Man call on me to discuss uses of KRAFEN in my products.**

I understand there is no obligation connected with my request for a sample and/or technical assistance.

Name_____

Company_____

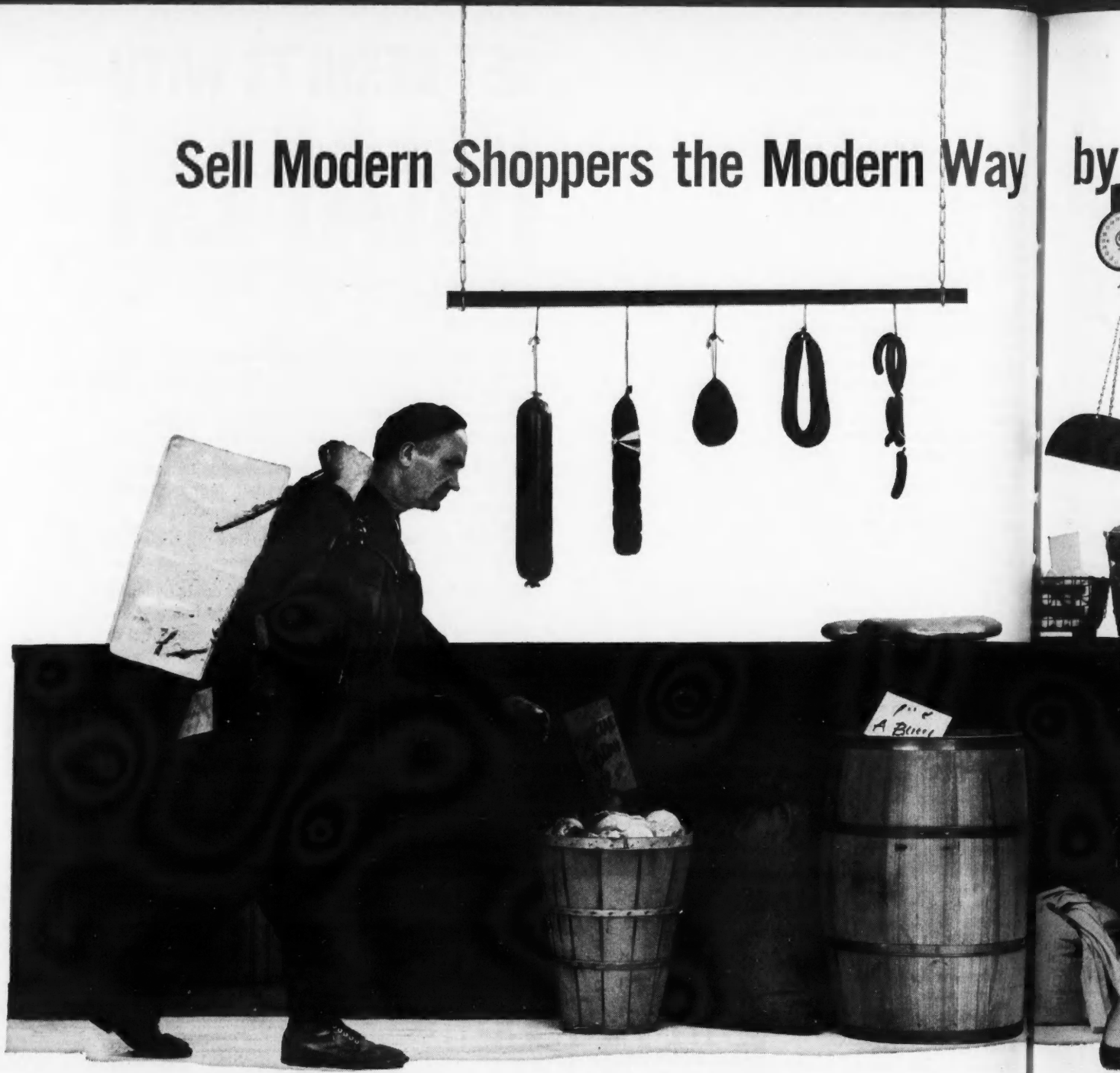
Title_____

Address_____

City_____ **Zone**____ **State**_____

7477 on Reader Service Slip.

Sell Modern Shoppers the Modern Way by



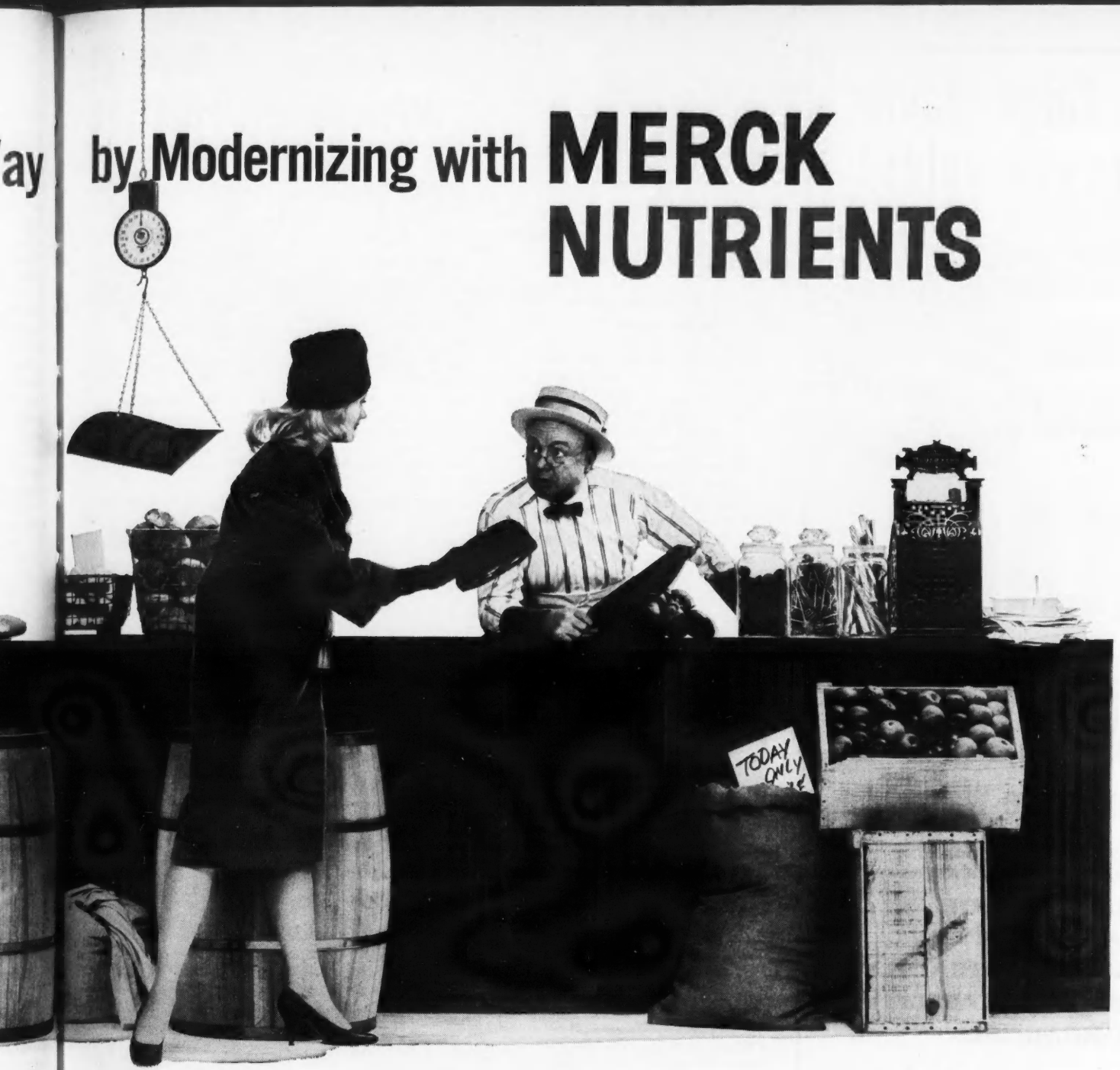
Would you dream of competing for today's food dollar with yesterday's processing, packaging or marketing methods? Of course not. Then why overlook the tremendous advances being made in nutrition? Vitamins and amino acids developed for food processing by Merck give you an opportunity to back up the appetite appeal and convenience of your products with the very latest nutritional story. Here are a few suggestions.

Fortification with Merck Ascorbic Acid provides strong vitamin C claims for any number of products—from gelatin desserts and instant potatoes to fruit juice blends and instant drinks. Merck Lysine can improve protein quality of wheat-based cereals and specialty breads and other processed vegetable foods. Vitamins B_{12} and B_6—both pioneered by Merck—are musts for all ages, are loaded with consumer appeal, give you unlimited opportunity for offering shoppers extra nutritional value in your products.

If you have new products in the works, or are looking for ways to modernize and stimulate sales of existing products—remember that Merck offers nearly a dozen nutrients for fortification. All are easily adaptable to normal food processing operations.

Get the full story on Merck nutrients and technical service. Call in your Merck representative now, or write directly to Rahway.

by Modernizing with MERCK NUTRIENTS



New booklet shows how you benefit from Merck's food processing laboratory. Send now for your free copy of "Merck Research for the Food Industry."

MERCK CHEMICAL DIVISION

MERCK & CO., INC. • RAHWAY, NEW JERSEY

7478 on Reader Service Slip.

(*Federal Register*, Feb. 2, 1960).

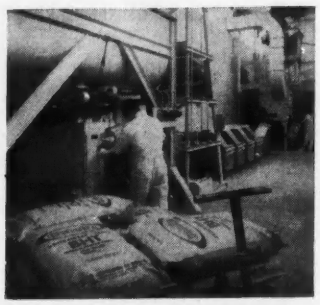
Brochure describes uses in various foods as well as solubilities in organic compounds and water solutions.

7480 on Reader Service Slip.

Six million pounds of antioxidant yearly

Expanded facilities for producing antioxidants have been completed by Catalin Corporation of America at Fords, N. J. Added facilities will increase production by approximately 40 per cent, raising capacity to some six million pounds per year.

One of the principal products in which production has



View of one section of newly expanded antioxidant facilities, at Catalin Corporation's Foods, N. J. plant, shows extensive use of stainless steel equipment

been boosted is Butylated Hydroxy Toluene, which the firm markets as CAO-3, in both food and feed grades.

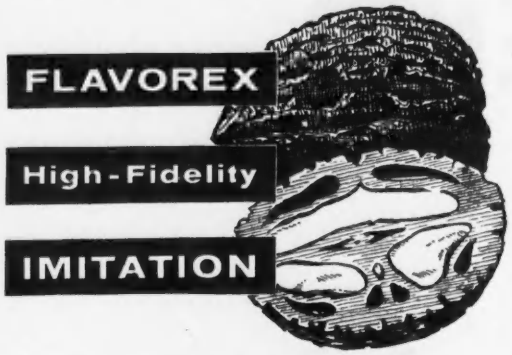
This is a product used by producers of food products to combat rancidity, loss of nutritive values, discoloration and other deterioration due to oxidation.

Supplier: Catalin Corporation of America, 1 Park Ave., New York 16, N. Y.

7481 on Reader Service Slip.

Special opportunities for you in the Classified Advertising section, page 120

New finer flavor improves sales!



BLACK WALNUT

with exclusive Walnadyne

--a synergistic compound that gives these advantages--

- **TRUER FLAVOR**
- **HEAT RESISTANT**
- **DISPERSES READILY**
- **GREATER STABILITY**
- **ECONOMICAL**

BLACK WALNUT NO. 2047

Used ½–1 oz PER 100 LB. BATCH. Price per gallon **$12.50**

Symbol of Fidelity

Better Flavors for Better Products

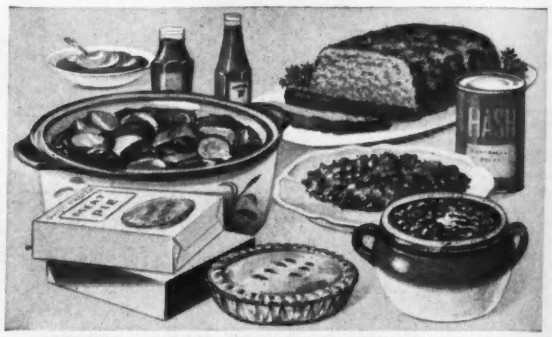
FLAVOREX CO., INC.

302 S. CENTRAL AVE., BALTIMORE 2, MD.

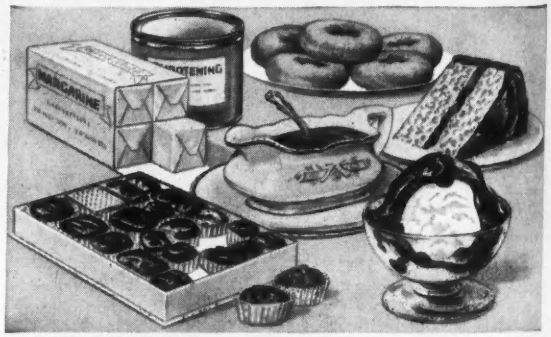
7479 on Reader Service Slip.

*From Staley's...*3 PRODUCT IMPROVEMENT POINTERS

PROTEIN SUPPLEMENT AND BINDER—Staley's* Soy Flour gives decided advantages in nutrition, texture, appearance, taste. Superior blending properties. Retains more fats and moisture in meat products. Extensively used in sausage, meat loaves, dehydrated soups, bakery products.



NATURAL MEAT FLAVOR BOOSTER—Staley's* Hydrolyzed Vegetable Protein is a concentrated source of flavor. Distinctive in taste. Flavor solids and monosodium glutamate content carefully balanced. Imparts ideal flavor to a variety of foods such as stews, meat loaves, frozen meats, meat pies, chili con carne, hash, baked beans, and table sauces.



FAT DISPERSER—ANTIOXIDANT—Sta-Sol* Lecithin Concentrate improves consistency and flow. Retards rancidity. Better dispersion improves texture, appearance, and eating qualities. Effective in gravies, sauces, shortening, margarine, candy and chocolate coatings, bakery products.

**Staley's* and *Sta-Sol* are registered trademarks of A. E. Staley Mfg. Co.

A. E. STALEY MFG. CO.
Decatur, Illinois

ATLANTA • BOSTON • CHICAGO • CLEVELAND • KANSAS CITY • NEW YORK
PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

7482 on Reader Service Slip.

Simple, inexpensive plastic "carrying collar" permits more product display than any other multipack. Tiny collar and handle cause no disposal problem once cans are removed

Simplest, easiest Can-Carrier yet!

Form Multipack Carrier From Preformed Roll

- **Low cost per unit**
- **High-speed application**
- **Complete product visibility**

NORB LEINEN, Associate Editor

High-speed specially designed six-packer applies plastic collar to cans from continuous preformed webs at rates up to 1200 cans per min. After application, web is cut to form six-pack units, and a retractable plastic handle can be fastened automatically

Basic innovation in multipacking replaces the conventional cardboard wrap-around package with a simple plastic collar-with-handle — applied in the plant at production-line speeds — that exposes individual cans to the shopper and makes can removal "a snap."

Named "Hi-Cone," the radically new can carrier, thoroughly researched and tested over a 10-yr period, is being introduced by a company equally new in the packaging field — Conex Division of Illinois Tool Works, 195 Algonquin Rd., Des Plaines, Illinois.

First actual users are breweries, but many other food marketers — including processors of canned milk, sea food, fruit juices, soft drinks, condiments, pet food, etc. — are studying installation of machinery, which is available on lease.

Carrier's low cost is likely to be of major interest to the food processor. The price difference — amounting to over-all carrier savings per six-pack of approximately one cent — may encourage vastly increased use of multipacking of food products.

Purchasing price per thousand, for example, can be as much as 35 per cent less than conventional multipack carriers. In addition, reduced production time, inventory space (one-third of space ordinarily required) and shipping weight (one-sixth that of conventional carriers) provide further savings.

Carriers are applied by means of a high-speed six-packer, specially developed by Food Machinery and Chemical Corp.

Some brewery installations now are operating regularly using these machines. With a top output potential of 1200 cans per min, units eliminate processing slowdowns at the packing end of filling lines. Slower-speed six-packers also will be available.

To further facilitate production, processors may apply a standardized FMC caser or comparable caser equipment to Hi-Cone six-packers.

Market test results reported by George Fry & Associates, nationwide management consulting firm, working in conjunction with various regional breweries, indicate that retailers and consumers will "go" for the new carrier.

In a major eastern market, test store sales of Hi-Cone six-packs were 123 per cent higher than sales in ordinary cardboard containers. Retailers not selected for the test soon requested the new package as a result of consumer demand.

In another area, all test store sales of a brand packaged in Hi-Cone carriers increased 23 per cent, while other retail outlets suffered 21 per cent decline of the same brand of beer.

Test stores in yet another area enjoyed a nine per cent sales increase over a like period the previous year.

For for carrier and 7484 for machine packer on Reader Service Slip.

Cans, carrier and all, stack easily and securely on store shelf or in home refrigerator. Handle retracts under stacking pressure

3M PRESENTS . . . creative packaging ideas by distinguished designers.

2, 4, 100, or?

HARLEY EARL

Harley Earl Associates design in "Scotchpak"—the heat-sealable polyester film. From this crack creative staff, a new boil-in-the-bag portion-pack for wieners. Tough, heat-sealable **"Scotchpak"** retains flavor, provides convenience, permits addition of sauces, condiments. Merchandises and displays well, too. Design also adapts to other foods — cigars, shotgun shells. Try **"Scotchpak"**— the film of the future for your new design ideas today. Write **Film Products Group, 3M Co., 900 Bush Avenue, St. Paul 6, Minnesota—Dept. CAH-60**

"SCOTCHPAK" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN. EXPORT: 99 PARK AVE., NEW YORK 16, CANADA: LONDON, ONTARIO

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

7485 on Reader Service Slip.

packaging

New "Fibre Zip" shipper combines . . .

End-load economy with top-unload convenience

Designed for cannery and similar uses, new Fibre Zip shipping case developed by Fibreboard Paper Products Corp. answers the demand for a container that can be filled from the end, but opened easily from the top and then reclosed and safely stacked.

Top-opening Pull-Tab follows the path set by special manufacturing techniques. After partial removal of contents in the store, the glue flap tucks inside the case, which is completely rigid and will stack safely even when partially empty.

A two-in. outside glue flap provides the tab to pull back top

Case markings remain clearly visible, since they are neither destroyed nor folded when case is opened.

The new carton's easy-opening feature is not provided at the cost of introducing other problems. No permit is required, nor are freight penalties imposed. On 6/10 cases run through revolving-drum rough handling tests, the Fibre Zip feature in no way caused any failure.

Cost is only slightly higher than regular cannery cases.

7486 on Reader Service Slip.

For more information on product at right, circle 7487 . . . see information request blank opposite last page.

"Knox furnishes us the packages that sell," say executives of major olive and pickle packer

"When packed in glass, stuffed olives—with their eye-catching colors—are a real stop signal to grocery store shoppers," says the manager of the olive department of one of America's leading food packers,* a major user of Knox glass.

"In our olive department, for example, 85% of the glass jars we use—in nine different sizes—are Knox products.

"We take full advantage of Knox's quality and clarity by hand-packing our olives in patterns that give maximum package attractiveness. We've found that this, plus proper display in the store, can increase a grocer's olive sales by ten to fifteen percent."

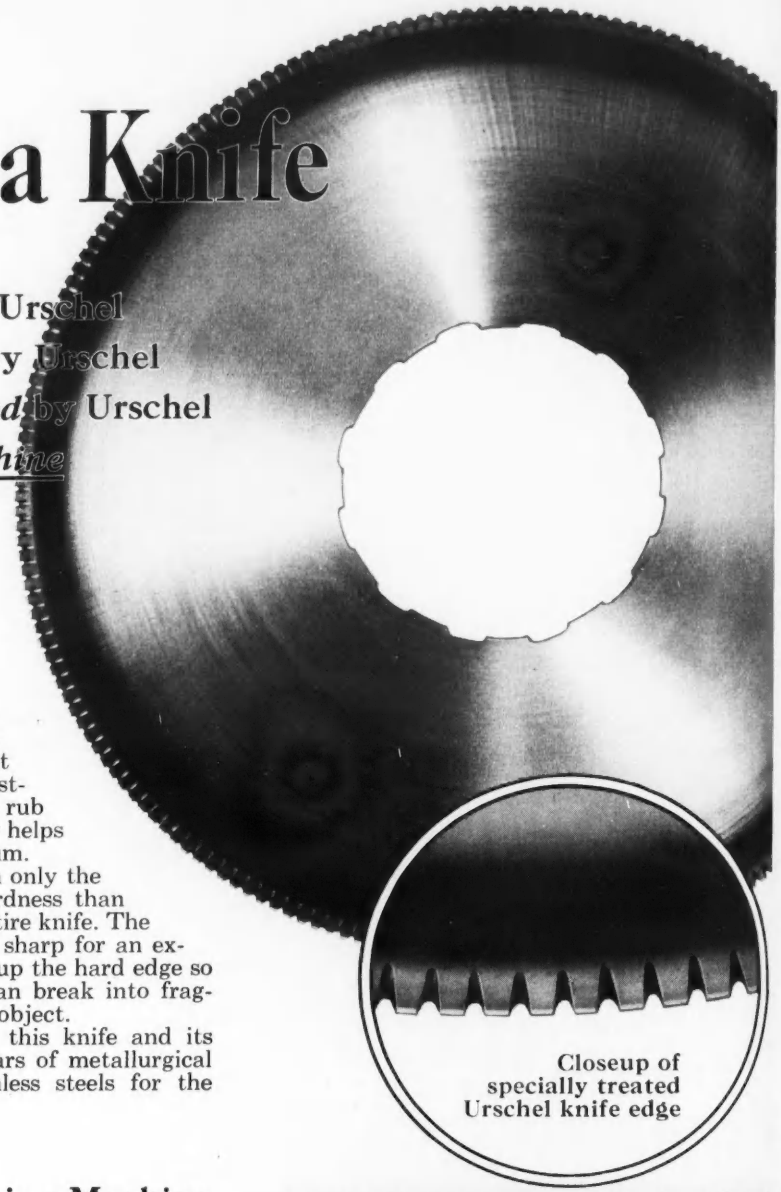
*Name available on request.

The manager of the same company's pickle department says: "In modern supermarkets, the product has to sell itself. That's why we use glass—to take advantage of impulse buying. Knox's quality glass can take the strain of the packing process—including the thermal shock of pasteurizing—and still give us the best available sales package."

Find out how Knox's quality product, reliable delivery, and outstanding service can play an important role in increasing your sales by furnishing the package with maximum shelf-impact. Contact Knox Glass, Inc., Knox, Pa., or any one of Knox's 37 sales offices.

the new / **KNOX GLASS**

This is a Knife



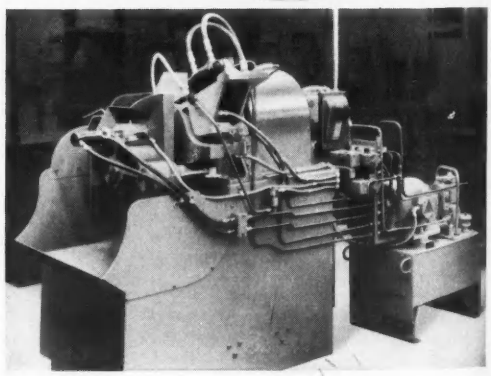
. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for an *Urschel machine*

It is the most important part of the machine because it cuts the product. The thickness of this knife is controlled to less than one ten-thousandth of an inch. Knives of such accuracy have *never* been made by others. This accuracy makes it possible to stack many knives on a knife spindle with such precision that knives can be replaced without adjustment and without having the knife rub against mating parts. This accuracy helps to reduce maintenance to a minimum.
Induction heating is used to harden only the edge of the knife to a greater hardness than would be practical to harden the entire knife. The hard edge causes the knife to stay sharp for an extended period. Soft material backs up the hard edge so that the knife will bend rather than break into fragments if the knife strikes a foreign object.
The selection of stainless steel in this knife and its treatment is based upon many years of metallurgical experience in the testing of stainless steels for the cutting of food products.

Closeup of specially treated Urschel knife edge

This is a Machine

. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for the *making of Urschel knives*



This is only one of many machines made in the Urschel shops for the manufacturing of knives. Standard machine tools cannot be purchased for the economical making of Urschel knives for the required rigid specifications. Research is continuously carried on at Urschel Laboratories in search of better methods and better materials for the manufacture of knives.

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

7488 on Reader Service Slip.

Now being produced in semi-commercial quantities

Biaxially oriented polypropylene film

* Like cellophane in clarity, gloss, tensile strength, stiffness, grease-resistance, machineability
* Like polyethylene in moisture-barrier properties, economy (potentially)

New contribution to packaging technology, "Kordite 1500" biaxially oriented, heat-sealing polypropylene film, combines the generally good properties of both cellophane and polyethylene film, and few of the deficiencies of either.

Available in development quantities from The Kordite Co., Division of National Distillers and Chemical Corp., the film is expected to have most immediate applications for wrapping baked foods because it is a good moisture barrier, is grease resistant, operates on existent machines and remains flat and unpuckered indefinitely.

Film's advantages stem from its basic chemical constitution, the biaxial orientation process and the heat-sealing coating used.

Biaxial orientation — ordinarily difficult and expensive, and heretofore especially so with polypropylene — is principal reason for film's superior packaging performance in thickness of only one-half mil.

Specifically, in the case of polypropylene, it increases tensile strength by about four times (or up to 10 times that of polyethylene) and increases stiffness by a similar amount.

The "two-way stretch" also improves optical properties and, more importantly, eliminates low-temperature brittleness associated with unoriented polypropylene.

The heat-sealing coating allows the film to be sealed in automatic cellophane packaging machines with little or no modification. Polyethylene-type machines need no modi-

Aluminum Foil Packaging– Light Barrier and Vitamin Protector

One of a Series of Reports by Reynolds Metals Company

An early report, No. 6 of this series, presented the advantages of aluminum foil as a light barrier particularly in regard to prevention of oxidative rancidity in products containing oil or fat. Numerous experiments were cited showing the catalytic effect of light as a major contributor to this common form of food deterioration. Report No. 14 dealt with the effects of light on vitamins in enriched, partially baked rolls.

Milk—a Dramatic Example

Of the great number of food products affected adversely by light, however, milk is perhaps the most dramatic example.* Light acts upon milk principally in the following ways: (1) by catalyzing the oxidation of ascorbic acid, (2) by causing the destruction of Riboflavin and Vitamin A, and (3) by stimulating the development of oxidized and activated flavors.

A series of tests conducted for Reynolds Metals Company by the Wisconsin Alumni Research Foundation compared various types of milk in four types of containers: clear glass, brown glass, waxed carton and aluminum foil carton. The milk thus packaged was exposed to both fluorescent light and sunlight. The fluorescent lighting was designed to simulate conditions in a supermarket —the product being placed in an open top refrigerated display case maintained at 50° F., with the lights developing an intensity of about 100 foot candles. Tests under fluorescent light were made prior to exposure, then after 3 and 10 days. Those using sunlight were made prior to exposure, then after 30 and 120 minutes.

Summary of Test Results

Summarizing the separate tests measuring vitamin content before and after the indicated light exposures, the results were as follows. For Riboflavin (Vitamin B_2), no losses of nutritional significance under fluorescent light, but substantial losses in sunlight for milk stored in clear glass and waxed cartons — aluminum foil and brown glass affording excellent protection. For reduced Ascorbic Acid (Vitamin C), much slower rate of loss for milk stored in aluminum foil and brown glass —the pattern appearing similar in fluorescent and sunlight. For Vitamin A, only the milk in clear glass containers showed losses under fluorescent light; in sunlight these losses were very rapid and there was also some loss in waxed cartons.

Tests for Flavor Scores

Tests for flavor scores produced findings of special interest, since there appears to be a correlation between the formation of oxidized and hay-like flavors in milk and the loss of Ascorbic Acid. In the Table shown here, all scores of 35 or under represent a flavor defect — a definite oxidized flavor in whole milk and a pronounced hay-like flavor in skim milk. Here even brown glass failed to retard materially the flavor change. Only the aluminum foil carton proved effective under fluorescent light. And the results in direct sunlight were almost identical.

Manufacturers concerned with vitamin retention, or with other effects of light, such as oxidative rancidity, are invited to call the nearest Reynolds sales office. Or write to Reynolds Metals Company, Richmond 18, Virginia.

*Remainder of this report summarizes findings by the Wisconsin Alumni Research Foundation, as set forth in an article entitled "The Effects of Light on Homogenized Whole Milk and Some Fortified Milk Products", by J. J. Birdsall, L. J. Teply, P. H. Derse, in *Food Technology*, Dec., 1958, Vol. 12, No. 12, Page 670.

FLAVOR SCORES OF FOUR TYPES OF MILK STORED UNDER FLUORESCENT LIGHTS AT 50° F.

Package	Homogenized Whole Milk			Vitamin and Mineral Fortified Whole Milk			Vitamins A and D Fortified Skim Milk			Multivitamin Fortified Skim Milk		
	0 days	3 days	10 days	0 days	3 days	10 days	0 days	3 days	10 days	0 days	3 days	10 days
Clear Glass	39	33	33	38.5	33	33	38.5	33	33	38.5	37	33
Brown Glass	39	34.5	34	38.5	37	34	38.5	34	33	38.5	37.5	33
Waxed Paper Carton	39	35	34	38.5	33	33	38.5	36	33	38.5	37	33
Foil Laminated Carton	39	38	38	38.5	38	38	38.5	38	37	38.5	37	37.5

See Reynolds shows on ABC-TV Network: "BOURBON STREET BEAT" and "ADVENTURES IN PARADISE" Monday Nights.

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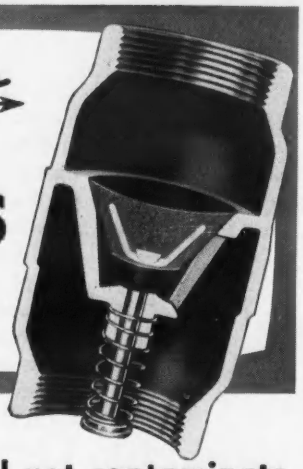
Strataflo

CHECK VALVES

for semi-solid and liquid food handling equipment



New valve resists acids, will not contaminate

The new No. 3300 Strataflo Check Valve is designed to eliminate many of the problems encountered in semi-solid and liquid food handling equipment. Acid cannot harm the rugged one-piece body which is cast of a high nickel alloy. A large port area and unique straight line flow give greater capacity with low restriction. There are no "pockets" to fill up and encourage contamination. Easily cleaned by back-flushing. Leak-proof Neoprene poppet is non-toxic, odorless and tasteless. Valve will operate in any position; 200 lbs. working pressure. Available in three sizes: ¾", 1" and 1¼". Write for Bulletin 208 for information and prices.

STRATAFLO PRODUCTS, INC.
FORT WAYNE, INDIANA

7490 on Reader Service Slip.

KOCH

White China Paint
BLOCKS MOLD ON PAINT WITH BMM*

The enamel that is dependably damp-proof and mold-proof. Goes on damp walls, drives past moisture, and bonds securely. Once applied, it stays put because of absence of mold. Ideal for areas where foods are processed or stored, and for all interiors where dampness or high humidity might provoke growth of molds. Easily applied, with brush, roller, or spray. Washable. Won't chip, crack, craze, or peel. Dries to a semi-gloss texture that looks like white chinaware. USDA accepted.

* Barium Metaborate Monohydrate, Pat.

QUANTITIES NEEDED

1 gal. covers 400 to 500 sq. ft. Use primer on unsealed surfaces. Use 1 part thinner to 10 parts White China Paint.

MAIL COUPON TODAY!

KOCH SUPPLIES INC. 2520 Holmes St., Kansas City 8, Mo., U. S .A., Phone Victor 2-3788 TWX: KC 225

Rush my order for KOCH White China Mold Inhibiting Paint with a money-back guarantee if I am not completely satisfied

	Gals.	5 Gals.	Cost
White China Interior Enamel @ $8.35 gal.			
White China Interior Primer @ $6.85 gal.			
KOCH Odorless Thinner @ $2.00 gal.			

Note: White China in 5 gal. cans @ 35c per gal. discount

Name_____

Your Firm_____

Address_____

City_____ **State**_____

7491 on Reader Service Slip.

fication at all.

Coating also allows the seals to be "peeled" apart, thus aiding package opening.

Disadvantage of Kordite 1500 is that, like cellophane, and like the very expensive biaxially oriented polyester films, it has low tear strength once tear is initiated (though it is quite difficult to start a tear).

Also, the heat-sealing coating still is somewhat more moisture-sensitive than desirable, causing possible web-unwinding difficulty. However, initial shipments will be made in polyethylene bags, circumventing this problem.

Film's exceptional clarity and freedom from haze or color will enhance attractively designed package

Film's current price of 3.5 cents per 1000 sq in. is below that of "K" cellophane, but well above regular cello's 2.7 cents per 1000 sq in.

In regular production, film is expected to be priced as low as 1.5 cents. Also, because film's stiffness allows it to be used in only one-half-mil thickness, this will help keep cost down in comparison with other films.

Company expects no difficulty in gaining complete sanction for use of the film as food packaging. Polypropylene itself has been approved by FDA for food use.

The heat-sealing coating has been proved in tests by a consulting laboratory not to transfer to food products — hence need not be submitted for approval as a "food additive." Formal FDA concurrence in this opinion is expected in the near future.

7492 on Reader Service Slip.

Easier food handling with Hackney Seamless Containers

More and more modern food processing plants use durable Hackney containers to cut handling costs. Here's why:

★ **Easy to clean**—with seamless construction.
★ **Easy to handle**—with stout welded handles.
★ **Easy to move**—with tough wearing ring on bottom.
★ **Easy to pour**—with a full-curled lip.
★ **Easy to select**—with a wide range of sizes in black, galvanized, tinned or stainless steel, or aluminum. Write for catalog.

Hackney MILWAUKEE

Pressed Steel Tank Company
Manufacturer of Hackney Products
1459 S. 66th St., Milwaukee 14, Wis.
Branch offices in principal cities

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

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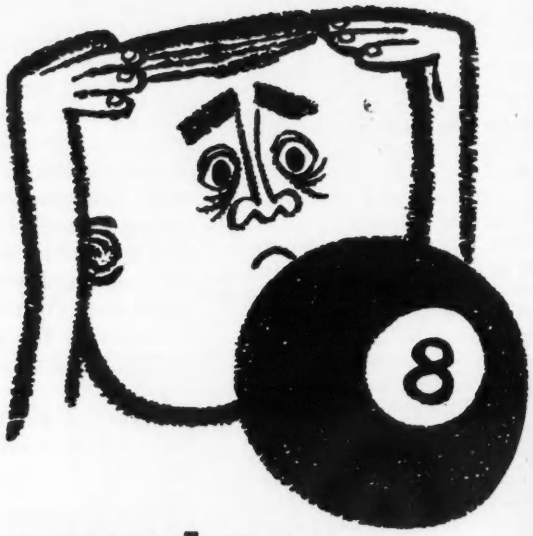


need more information...

Note there is a key number at the end of editorial articles or advertisements. To request more information circle the proper number on the convenient form opposite the last page. Send the form to us . . . we do the rest. Information comes direct to you. No obligation, of course.

GAYLORD PACKAGING DELIVERY
IS ALWAYS ON THE BALL

Your packaging operation can't get to first base without steady container delivery. So make Gaylord your mainstay—because Gaylord's 16 plants all over the country pitch in to keep your boxes coming, day in and day out, when you want them, where you want them.

Don't let erratic supply throw you a curve. Call your nearby G-Man now, and get him on your team.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

Gaylord Boxes

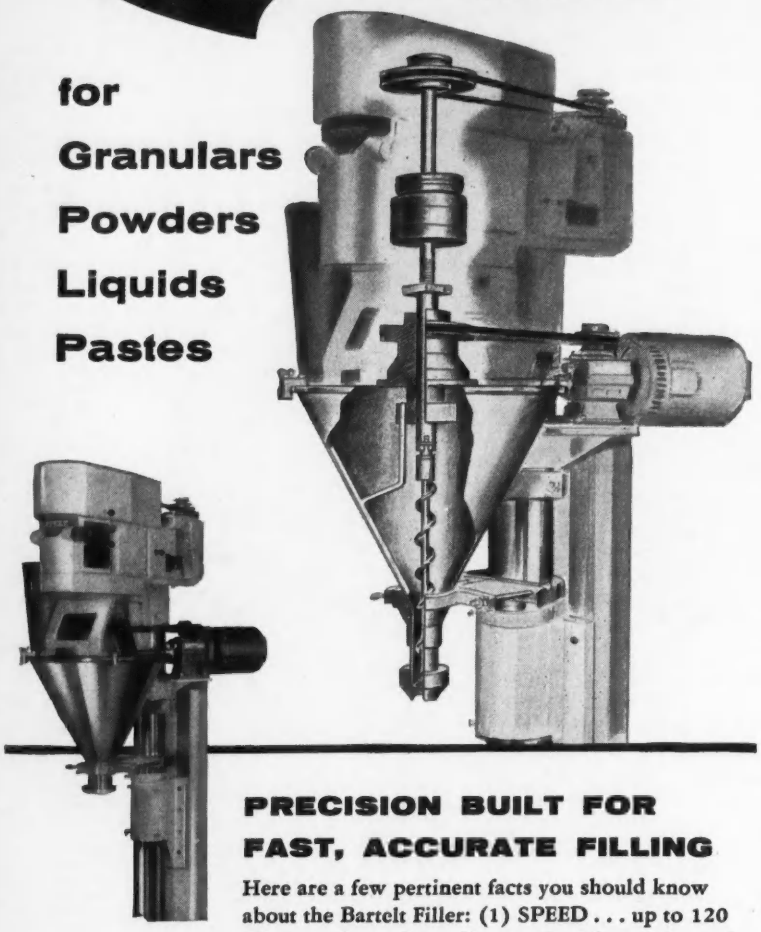
IN CANADA · CROWN ZELLERBACH CANADA. LTD. VANCOUVER. B. C.

HEADQUARTERS. ST. LOUIS
PLANTS COAST TO COAST

For more information on product at right, circle 7494 see information request blank opposite last page.

High speed, automatic BARTELT filler

for
Granulars
Powders
Liquids
Pastes



PRECISION BUILT FOR FAST, ACCURATE FILLING

Here are a few pertinent facts you should know about the Bartelt Filler: (1) SPEED . . . up to 120 fills per minute depending on the fill qualities and characteristics. Split fills can more than double this speed. (2) ACCURACY . . . variation no more than 3% (plus or minus 1½%) on most products. (3) VERSATILITY . . . *One* Bartelt Filler will handle granulars, powders, liquids, and pastes by means of interchangeable tooling. It can be applied to all types of operation . . . from hand lines to automatic packaging machinery. Fill quantities can be varied from one gram to five pounds.

Write Today for NEW Filler Catalog

BARTELT ENGINEERING COMPANY
1900 Harrison Ave., Rockford, Ill. • New York Office: 370 Lexington Ave. NYC

7495 on Reader Service Slip.

packaging

Releasing parchment now glueable, too

For applications requiring both release and adhesion, new type of releasing parchment is release-treated on one side and "glueable" on the other.

Product thus combines the releasing properties inherent in release-treated vegetable parchment with a surface that will readily accept glue, cements and other adhesives.

In the food industry, new-type parchment has special application possibilities as separator to prevent the fusing of frozen food, and as a commercial bakery-pan liner.

In bakery usage, "glueable" releasing parchment can be laminated to fiberboard lids of aluminum foil pans used to package sticky products — thus eliminating need for separate loose sheet of releasing parchment as insert between lid and product.

(Glueable Patapar Releasing Parchment is development of Paterson Parchment Paper Co., Bristol, Pa.)

7496 on Reader Service Slip.

New super-protective coating for bottles

New all-purpose coating for glass containers, already approved by FDA, is said by the manufacturer, Ball Brothers Co., Inc., to provide a more durable glass-surface protection than stearates, silicones or emulsion coatings of high-molecular-weight polymers.

No labeling problems will result from application of "AP" (Abrasion Protection) coating. Both laboratory and filling line tests have revealed that AP-coated containers have labeling characteristics superior to those of uncoated bottles. No special adhesives are needed.

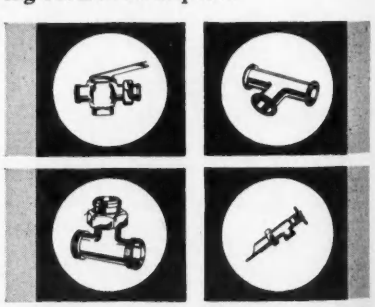
During extensive laboratory and field tests, AP-coated jars were subjected to retort temperatures of 240 F for 40 min. Such retorting had no adverse effect on the coating's protective qualities.

7497 on Reader Service Slip.

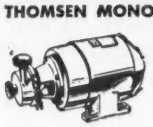
Take down and assemble in seconds with...

PROVEN CLAMP CONNECTIONS

Looking for a set-up on which to standardize? The answer is Thomsen stainless steel lines and fittings. Key to maximum efficiency for clamp-in-place or take-down lines is the new Thomsen vise action clamp which has more exclusive features than any clamp on the market. Go Thomsen all the way with pumps, tubing, fittings and valves. They will provide valuable engineering counsel on request.



THOMSEN MONO-MOUNT SANITARY PUMP



Here at last is the common sense sanitary pump design. The new Mono-Mount makes assembly and disassembly fast and easy. Stainless steel —no rust, no corrosion, easy cleaning.

FREE—New Thomsen clamp and fittings catalogs—write Department F

L. C. THOMSEN & SONS, INC.
KENOSHA, WIS.

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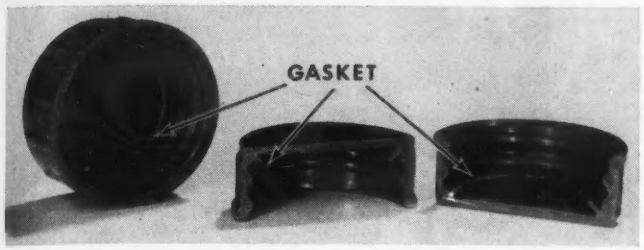


Low-cost plastic cap with built-in 'gasket' . . .

Maintains ooze-free seal without traditional liner

NEW low-cost plastic cap for cans (or bottles) employs a plastic "gasket" — created as part of the basic cap (see photo) — as a highly effective sealing band.

The traditional cap liner is eliminated, and, along with it, the processor's problem of liner selection, warehousing and stocking.

Consumers will benefit, because the new cap eliminates problems of liners sticking to spouts, or lost seals which cause leakage.

Called "Un-A-Top" because of its unique design (pat. pending), cap is made of corrosion-free Phillips "Marlex" linear polyethylene, which is inert to most foods, and is priced competitively with metal screw caps and under other plastic or aluminum caps.

Independent laboratory tests revealed these findings for the new caps:

1) In contact with a name-brand ketchup at 95 F and 95-100 per cent relative humidity for 200 hr, neither the Marlex caps nor the ketchup were affected. Under the same conditions, steel samples and the ketchup became discolored.

2) Just 21 to 27 per cent as much torque is needed to effect a water-tight seal with Un-A-Top caps than is required for aluminum or steel caps.

3) At 130 F, for 24 hr, Un-A-Top caps on steel cans retain the water seal.

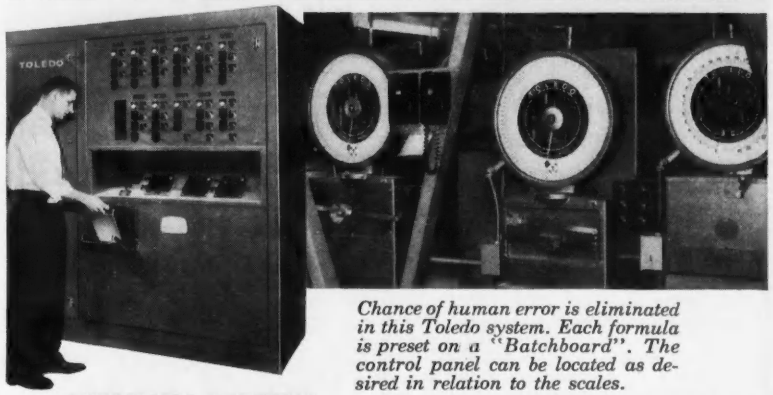
Developed and produced by Dover Molded Products Co., Dover, Ohio, the caps are available in a variety of colors, and designs, and a limited number of sizes, and may be stamped for prices, engraved or embossed as desired.

7499 on Reader Service Slip.

Rugged leak-proof serviceability of new "Un-A-Top" cap was tested on powerful paint-mixing machine

TOLEDO Reports on Automatic Weighing

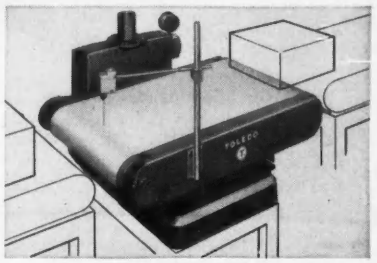
★ NEW IDEAS FOR COST-SAVING

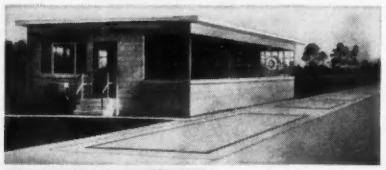


Chance of human error is eliminated in this Toledo system. Each formula is preset on a "Batchboard". The control panel can be located as desired in relation to the scales.

AUTOMATIC BATCHING

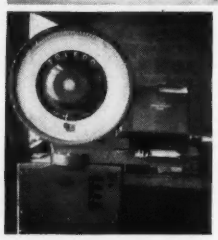
Operator at convenient remote location has full command of a multiple scale batching system with Toledo Remocon. As many formulas as required are pre-set on "Batchboards" and inserted into panel. This is one of several types of Toledo remote-control batching systems for today's needs, including punch card, "Formulaplug" and digital scanner. Ask for Bulletin 2964.





CHECKWEIGHS IN-MOTION

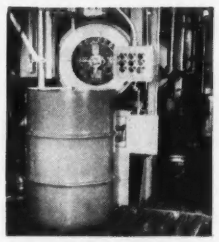
Many plants today are putting Toledo Automatic Checkweighers into their conveyor lines. Models to provide continuous, 100% in-line checkweighing of items from a few ounces to 200 pounds. Motorized belt. Handle sacks, cartons, packages, pieces, parts. Ask for Bulletin 2968.



LOAD CELL DIAL DOES TRIPLE DUTY

. . . ALSO PRINTWEIGH RECORDING

One remote dial serves *three* platforms in this Toledo Electronic Load Cell Scale for truck weighing at a large cement plant. With a truck on three platforms, scale reads individual axle loads or total weight. Equipped with Printweigh "400" to print full figure weight data. Brings new versatility to weighing. Request Bulletin 2970.



AUTOMATES DRUM-FILLING

In this oil industry plant, a Toledo sub-surface filler automatically eliminates foaming and controls drum filling. The scale is keyed into conveyorized system . . . provides faster, more accurate filling. Saves time, labor, avoids loss of material and customer goodwill. One of many operations where Toledo controls guard costs. Ask for Bulletin 9030.

WRITE TODAY for specialized help from our Custom Products Division, or contact the Toledo Office near you, to solve your problems in batching, checkweighing, drum-filling, load cell applications. TOLEDO SCALE, Division of Toledo Scale Corporation, Toledo 12, Ohio.

(Toledo Scale Co. of Canada, Ltd., Windsor, Ont.)

SERVICE Factory-Trained 240 Cities

TOLEDO®

Headquarters for Weighing Systems

7500 on Reader Service Slip.

FISCHBEIN LOW COST EFFICIENT

BAG CLOSERS

- Total weight, only 10½ pounds.
- Requires no installation, supports of plant space . . . merely plug into any electrical outlet.
- Handles all textile and paper bags.
- Closes average 100 lb. bag in less than 6 seconds.

CARRY MACHINE TO THE BAG!

WRITE FOR COMPLETE CATALOG FILE OF BAG CLOSING EQUIPMENT

DAVE FISCHBEIN CO., Dept. 2A
2720 30th Ave. S., Minneapolis 6, Minn., U.S.A.

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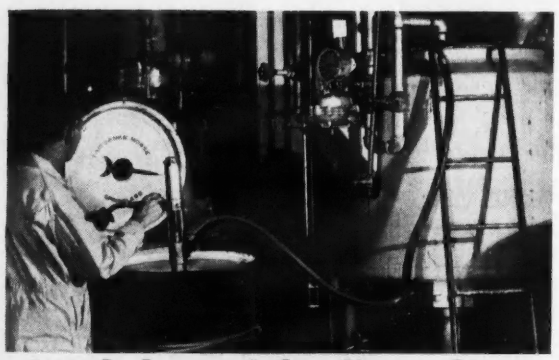

Batch by weight direct from drum . . . quickly and exactly!

Graco Fast-Flo Pumps reduce handling costs. They transfer measured amounts of different fluids direct from original containers. Ideal for batching, applying or mixing . . . fluids are transferred quickly and safely. Aids good housekeeping; eliminates contamination.

Send for more information about this amazing *Graco* Fast-Flo that's suited both for large and small operations. It handles materials as thin as alcohol, as thick as cookie frostings! Fast-Flo Pumps are also available in stainless steel. Send for free idea booklet!

For nearest GRACO Supplier
SEE the telephone directory YELLOW PAGES
Look under "SPRAYING EQUIPMENT"

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New York, N. Y.
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Detroit, Michigan
Atlanta, Georgia
Chicago, Illinois
Houston, Texas
San Francisco, Cal.

Sales Office
Toronto

7502 on Reader Service Slip.

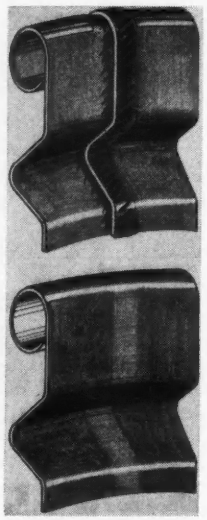
Major improvement in lined pails for food products provides continuous smooth inner surface, and . . .

Minimizes contamination at side seam

Five-gal lined pails are used to package many foods for commercial use — jams and jellies, caramel coloring, cola concentrates, cooking oils, chocolate and other syrups and flavorings and bakers' supplies such as fondants, frostings and shortenings.

Special linings developed for these products protect against contamination from corrosion. However, all lined steel pails have an "Achilles heel" at the side seam.

Coatings tend to pull away from the sharp edges of the



At pail's top rim, where side seam is formed into the curl, conventional seam's excess metal (top) forms "step down" vulnerable to leakage. Continuous smooth surface of planished seam (below) assures perfect seal between pail and cover

metal seam — leaving it unprotected. Even a pinpoint imperfection along the side seam may start the corrosion process.

New manufacturing process

20 CANS A MINUTE . . . *opened, drained and rinsed!*

The new Langsenkamp "101" Can Opener is completely automatic . . . does the work of four men. Depending on the product's consistency, it can open, drain and rinse up to 20 No. 10's a minute. Positively eliminates the chance of can slivers getting into your product.

Ideal for canners, frozen food processors, bakers, or any users of liquid or semi-paste product . . . for any product that will drain through a 4" opening. Provides cleaner, more efficient handling—no loss due to spilling or splashing of product. Equipped with stainless steel underpan 60" x 20" x 15" wide, ¾ hp motor, 806 lbs. net weight, pump optional.

The "101" Automatic Can Opener is one of a complete line of Langsenkamp machines for food processors which also includes manually-operated can openers and automatic can crushers. Write for full details.

F. H. LANGSENKAMP CO.
227 E. SOUTH ST. • INDIANAPOLIS 4, INDIANA

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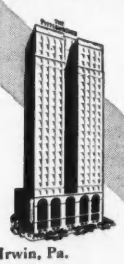
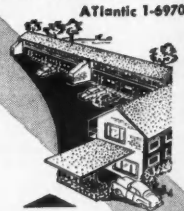
Your Choice for Convenience in PITTSBURGH

HOTEL PITTSBURGHER
Right in the heart of the Golden Triangle 400 outside rooms with TV and every comfort of modern hotel design. General Forbes Lounge and Dining Room . . . Air Conditioning. Airport Limousine and Taxi Service.
Forbes Avenue Below Grant
ATlantic 1-6970



JACKTOWN MOTOR HOTEL
The very finest accommodations. 60 air-conditioned rooms with TV, telephone, combination tile baths. Excellent dining room. Facilities for group parties 15 to 500.
Route 30 Irwin, Pa.
1 mile West of Irwin Interchange
UNderhill 3-2100



KNOTT K HOTELS
Joseph F. Duddy, Gen. Mgr.

HOTEL PITTSBURGHER MOTEL
Opposite Greater Pittsburgh Airport on beautiful Airport Parkway West. 56 luxurious, air-conditioned rooms with tile bath, TV, private phone. Courtesy car to and from airport.
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* Teletype Service. For immediate confirmation of reservations at no charge . . . telephone any Knott Hotel—or teletype PG-29.

7504 on Reader Service Slip.

introduced by Bennett Industries, Inc., Peotone, Ill. for their "Hi-Bake" pails, minimizes the possibility of pinholing, with the smoothed side seam produced by "planishing" (at no extra charge).

A force of 16,330 lb is exerted by the planishing machine in smoothing the metal side seam and making the body a continuous tube, with no weld-lap or rough edges.

Thus prepared, pail interior provides a *continuous* smooth surface to which the special coating material adheres completely and evenly.

7505 on Reader Service Slip.

41 packaging substances given FDA approval

FDA has given official approval to 41 substances migrating to food from cotton and cotton fabrics used in dry food packaging. Complete list follows:

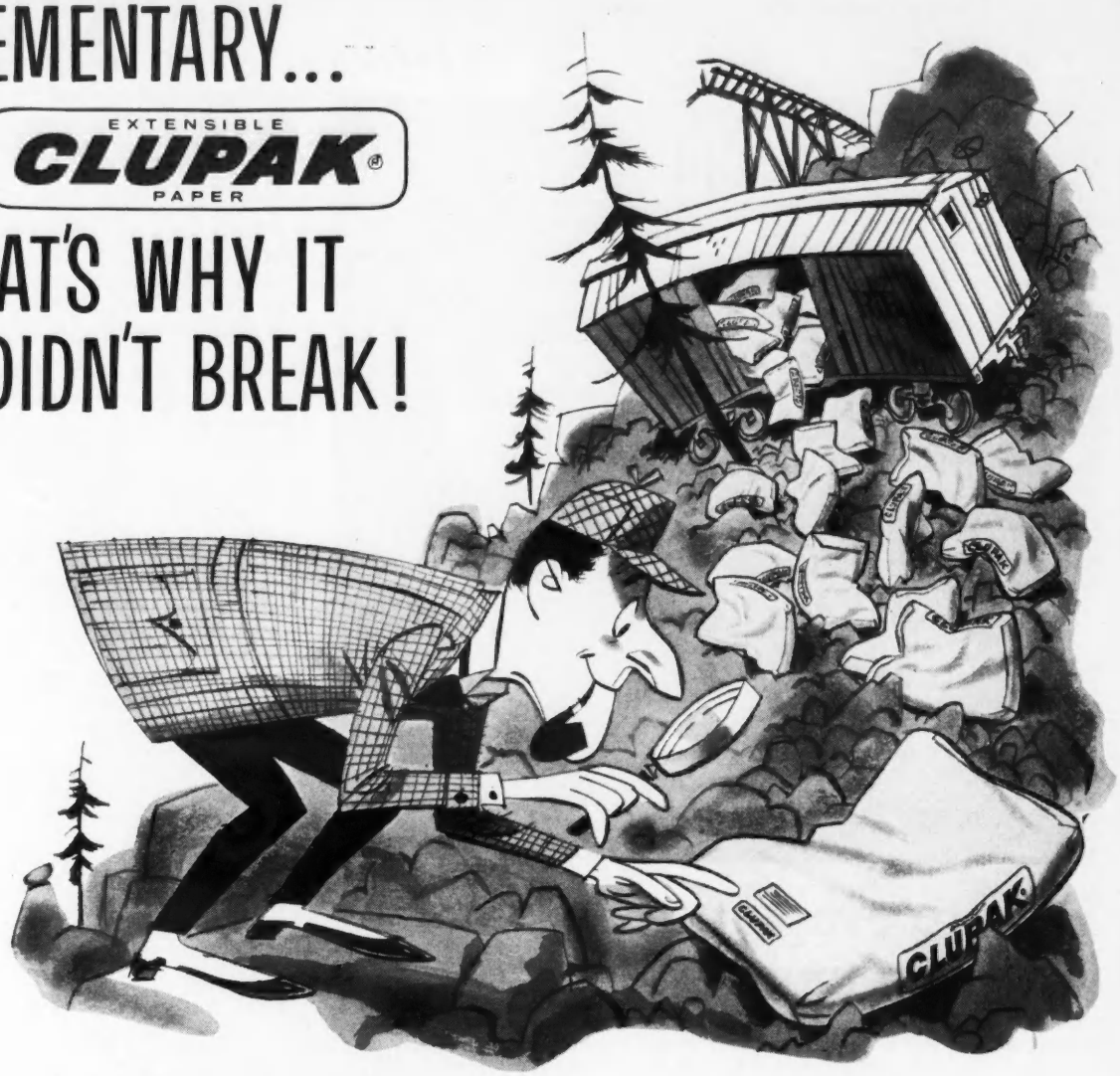
Acacia (gum arabic)
Acetic acid
Beef tallow
Calcium chloride
Carboxymethylcellulose
Coconut oil, refined
Corn dextrin
Cornstarch
Fish oil (hydrogenated)
Gelatin
Guar gum
Hydrogen peroxide
Japan wax
Lard
Lard oil
Lecithin (vegetable)
Locust bean gum (carob bean gum)
Oleic acid
Peanut oil
Potato starch
Sodium acetate
Sodium bicarbonate
Sodium chloride
Sodium hydroxide
Sodium sulfate
Sodium silicate
Sodium tripolyphosphate
Sorbose
Soybean oil (hydrogenated)
Stearic acid
Talc
Tall oil
Tallow (hydrogenated)
Tallow flakes
Tapioca starch
Tartaric acid
Tetra sodium pyrophosphate
Urea
Wheat starch
Zinc chloride

Check page 115 for helpful technical literature

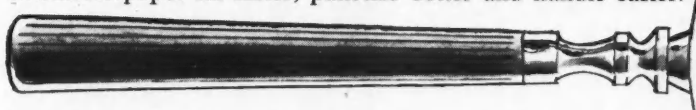
ELEMENTARY...

EXTENSIBLE CLUPAK® PAPER

THAT'S WHY IT DIDN'T BREAK!



New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all. And multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.



Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid strength specifications established by Clupak, Inc. for your benefit.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N.Y. 36, N.Y.

7506 on Reader Service Slip.

FLUIDICS* AT WORK

How to evaporate "problem" products more efficiently

If you evaporate products that are (1) heat sensitive, or (2) highly viscous, or (3) low in thermal conductivity, take a look at the Pfaudler Wiped Film Evaporator.

What makes it so well suited to handling difficult evaporations is the *mechanically wiped evaporating surface.*

It works like this: Centrifugal force of an internal rotor (you can see it in the picture above) holds four free-floating wipers in contact with the evaporator wall.

Thin uniform film. These wipers spread your product over the entire evaporating surface in a *thin, uniform film.* Slots in each wiper prevent product "curl" forward of the wipers and accelerate product movement down and *off* the wall.

Efficient heat transfer. Since the heated wall is kept completely wet, you are sure of maximum heat transfer—from every square foot of surface—very important for high capacity with viscous and heat-sensitive materials, or those with low thermal conductivity.

Test program. In our Test Center we keep available a four-square-foot Wiped Film Evaporator for making evaluations.

When it comes to production units, you can select from units offering 4 to 100 square feet of evaporating area, or larger units by custom design. (That's a 50-square-foot one being assembled in the picture.)

For more information about testing your product, or a detailed specification sheet, write to our Pfaudler Division, Dept. FP-60, Rochester 3, N. Y. Thank you.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

7507 on Reader Service Slip.

packaging

Commercial Standard for polyethylene film printed

A printed edition of Commercial Standard CS227-59, "Polyethylene Film," has been announced by Commodity Standards Division, Office of Technical Services, Business and Defense Services Administration, US Dept. of Commerce.

The Standard covers dimensional tolerances, types, grades, classes and kinds of polyethylene film, intrinsic quality requirements and test methods.

The dimensional tolerances include thickness, yield, width, length and flatness.

Intrinsic quality requirements include density, appearance, impact properties, tensile properties, slip, clarity, ink adhesion, heat sealability and odor. A sampling method and means of identification are included.

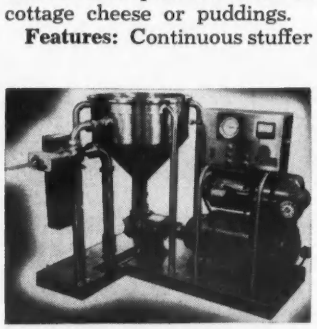
The Standard was propsed by The Society of the Plastics Industry, Inc., and has been endorsed by a representative cross-section of the industry.

Copies may be purchased for 15 cents each from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Automatically stuffs sausage, dairy products

Uses: Stuffer is designed to handle sausage meats and wide range of semi-solid or viscous food products such as cottage cheese or puddings.

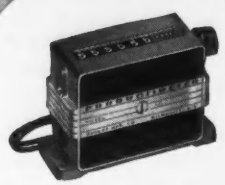
Features: Continuous stuffer



Stuffer is constructed of stainless steel to meet rigid sanitation requirements

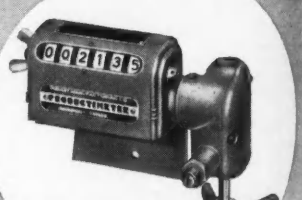
is simple to use. Desired filling cycle is quickly set on two simple controls. Machine then

Count ALL PRODUCTION *with accurate, dependable* **DURANT PRODUCTIMETERS**



ELECTRIC COUNTER

HEAVY DUTY STROKE ACTION



BOTTLE AND CAN COUNTERS

CASE COUNTER

Eliminate profit-eating losses . . . Productimeters register accurate count of every unit processed . . . insure economical plant operation and maximum use of man hours.

DURANT MANUFACTURING CO.

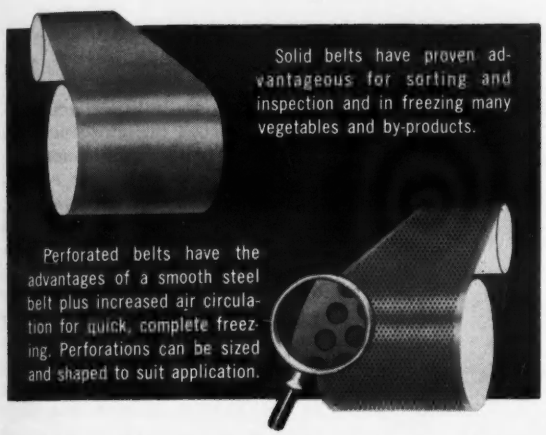
Send for CATALOG 51-55

1951 N. Buffum St., Milwaukee 1, Wis.
51 Thurbers Ave., Providence 5, R.I.
Representatives in Principal Cities

DURANT COUNTING INSTRUMENTS

7508 on Reader Service Slip.

How SANDVIK Steel-Belt CONVEYORS Lower Vegetable Processing And Freezing Costs


Solid belts have proven advantageous for sorting and inspection and in freezing many vegetables and by-products.
Perforated belts have the advantages of a smooth steel belt plus increased air circulation for quick, complete freezing. Perforations can be sized and shaped to suit application.

- With solid or perforated belts of stainless steel—Any length or width
- Product separates easily from smooth belt surface. Breakage eliminated
- No stretch—no maintenance—Sandvik "Tru-Track" design assures permanent alignment
- Unaffected by vegetable acids, water, other corrosives
- Easy cleanability; impermeable surface simplifies bacteria count control—prevents taste contamination
- Permanent strength, high load capacity, long life

Three Sandvik belts are used in this potato specking table at Nittany Packing Co., Center Hall, Penn. Peeled potatoes load on side belts. Cleaned potatoes leave table on center belt after removal of eyes and buds. Side belts also discharge waste.

SANDVIK STEEL, INC.
STEEL BELT CONVEYOR DEPT.
1702 Nevins Rd., Fair Lawn, N. J., SW 7-6200
Cleveland • Detroit • Chicago • Los Angeles
IN CANADA: Sandvik Canadian Ltd., P. O. Dr. 1335, Sta. O., Montreal 9, P. Q.
MANUFACTURERS OF STEEL BELT CONVEYORS FOR OVER 40 YEARS
SS-217

7509 on Reader Service Slip.

runs automatically, stuffing or filling within two per cent of required package weight.

Checking hopper to keep it from running empty is only supervision necessary.

Description: Production capacity of stuffer is 5000 lb per hour on frankfurters.

Unit is compact, requiring only 44 in. by 69 in. floor area.

(Model 2020 Stuffer is a development of St. John & Company, Dept. R, 5800 S. Damen Ave., Chicago 36, Ill.)

7510 on Reader Service Slip.

Obliterates old stenciling, permits carton re-use

Uses-Features: New-formula obliterating fluid completely covers over and blocks out old stenciling, penciled or painted markings, labels, etc., transforming used cartons, boxes and crates into clean, fresh-looking containers.

Handy, easy-to-hold aerosol container is always ready to use

Aerosol-dispensed fluid also is fast and easy way to correct stenciling errors or to re-mark and salvage over-runs and unused cartons.

Description: Tan colored (to match corrugated cartons), and very opaque, material sprays out of container in a dense, compact cone at touch of a finger. It is non-clogging, has good coverage, dries quickly and is waterproof.

("Stencil-Kover" new-formula aerosol obliterating fluid is manufactured by Reynolds Ink, Inc., 4502 Euclid Ave., Cleveland 3, Ohio.)

7511 on Reader Service Slip.

Colletta makes possible money saving mechanical labeling on short runs. Works on proven labeling system with full surface gluing and micro-glue adjustment. No glue smearing. Hair line register. Handles stiff glues and synthetic adhesives equally well.

Operation change-over and setting up is simple and fool proof. No special skill needed. Readily converted to fully automatic through use of easily fitted attachments. Changes from one size or shape of container to another take less than 5 minutes. Almost unlimited versatility, up to one gallon size. Send today for complete information. Use coupon.

another **SEMI-AUTOMATIC** by **PNEUMATIC**

Pneumatic Scale Corp., Ltd.
75 Newport Avenue, Quincy 71, Mass. *Branches, Chicago and New York*
Please send us complete information on Colletta Labelers.

NAME_____ Position_____
COMPANY_____
ADDRESS_____

7512 on Reader Service Slip.

At huge Pevely Dairy, St. Louis, one-and-one-half miles of chain conveyor minimize dock congestion during load-out 'surge periods,' providing a . . .

Modern Way to Load a Dairy-Truck Fleet

FP STAFF

▲ Conveying systems operate in dairy's three main areas. Full-case system originates in bottling room (A), goes through retail truck loading cold room (B) and then through yard to wholesale truck and trailer-loading area which spans length of a 300-ft-long garage. Returning, the conveyor acts as an empty case system — originating in the garage, then proceeding through yard to retail truck unloading area and on to bottle-washing area. (To protect cases enroute from wind, rain and dirt, yard conveyors are protected by corrugated aluminum sheet.) ▼

One of the longest conveyor systems of its kind ever assembled in one plant enables Pevely Dairy Company, largest St. Louis dairy, to handle thousands of cases of both cartoned and bottled milk during peak load-out periods with minimum congestion and time-loss.

The system permits (rapid) loading of entire fleets of wholesale and retail delivery trucks.

The full-case system originates in the bottling room, where both glass bottles (for retail) and paper cartons (for wholesale) are filled and loaded into cases.

Cases are placed on five feeder lines, each with its own case-stacking machine, and conveyed, stacked five high, to the main conveyor line leading to the cold room.

Upon entering cold room, the chain conveyor descends to floor level and operates as an in-the-floor system.

In this room, milk in bottles is removed from the conveyor and stored for retail and home delivery-truck loading from a loading platform (see diagram).

Cartoned milk, however, is conveyed at about 22 fpm through the cold room, across a 215-ft-long yard area — where the chain conveyor is inclined for a total rise of about 60 in. — to the loading dock.

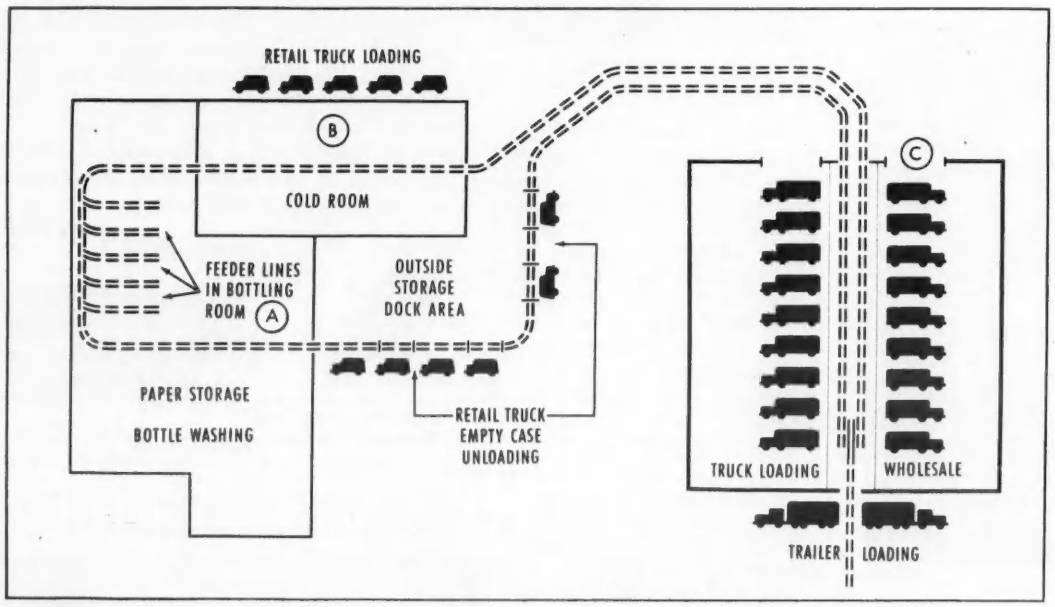
The dock area for wholesale truck loading consists of a platform 300 ft long, 5½ ft wide and 3¼ ft high. Built into this platform are the two double-strand channel tracks that comprise the in-the-floor chain conveyor.

Wholesale milk truck drivers back up to the truck-bed-level dock, open their rear truck-doors and drag off their empty stacks onto the return conveyor. Trucks then are ready to receive filled cases from the adjacent loading conveyor at load-out time.

The far end of the dock, extending beyond the garage building, has provisions for loading heavy-duty tractor-trailer units. Conveyor for this area incorporates reversible H-class pintle chain, and inclines slightly to deliver cases on a level with the trailer doors.

The return conveyor system for conveying empty cases to the washing and filling area declines from the wholesale loading and unloading area to a level where retail delivery truck drivers also can unload their empties.

Case conveyor in this area is so arranged that drivers can pull up alongside the conveyor, open the side doors of their trucks and stack off empty cases directly onto the return conveyor — reportedly the first such arrange-



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ment for unloading empty cases at retail truck level in any dairy.

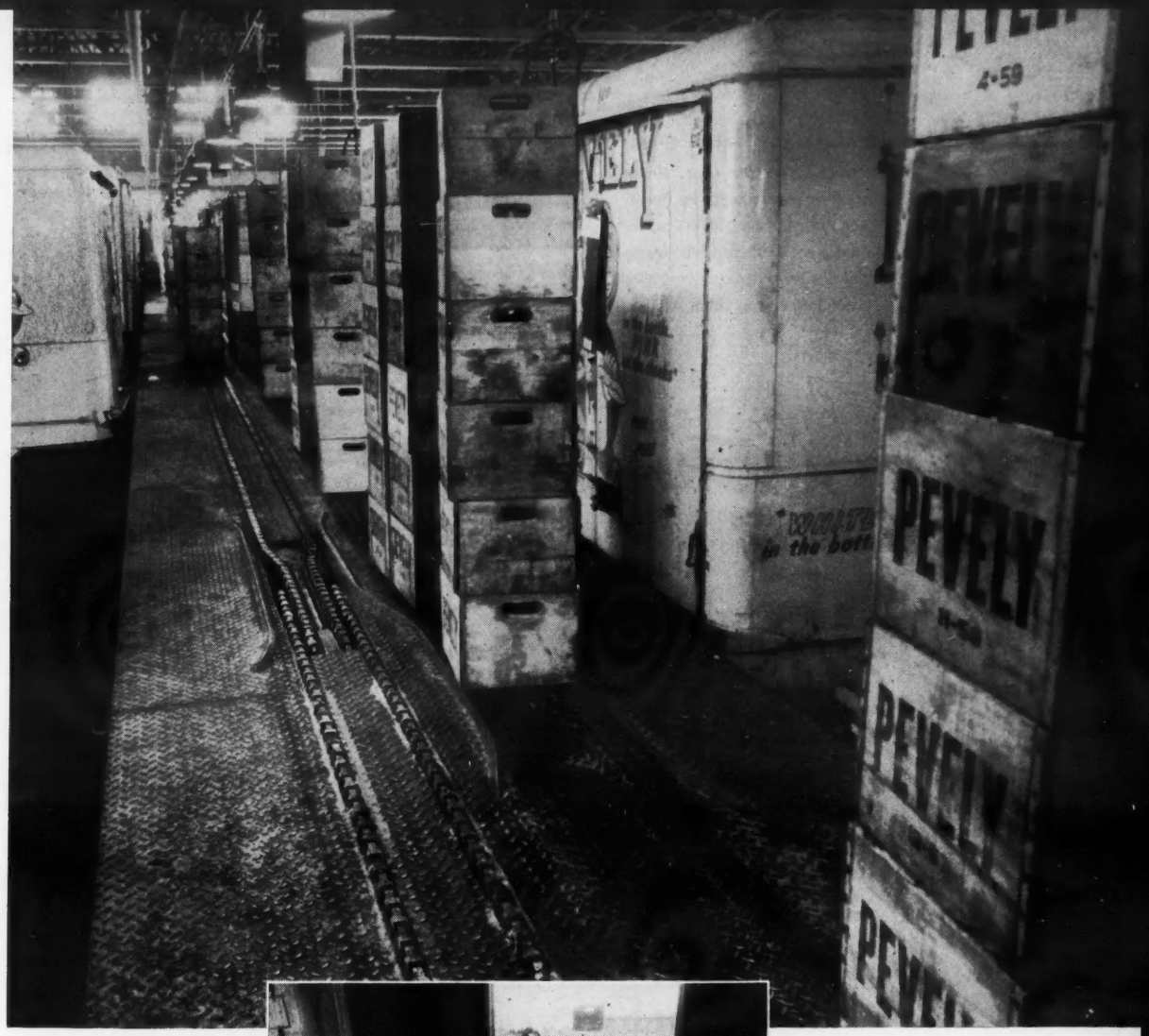
Key element in the conveying system is the swivel-type Promal 4250 conveyor chain especially designed by Link-Belt Company, Chicago 1, Ill., for conveying cases, cartons, cans and crates in dairies and other bottling plants.

This chain operates around a 15-in.-radius horizontal curve, assuring a smooth, simple conveying system no matter how irregular the path of travel.

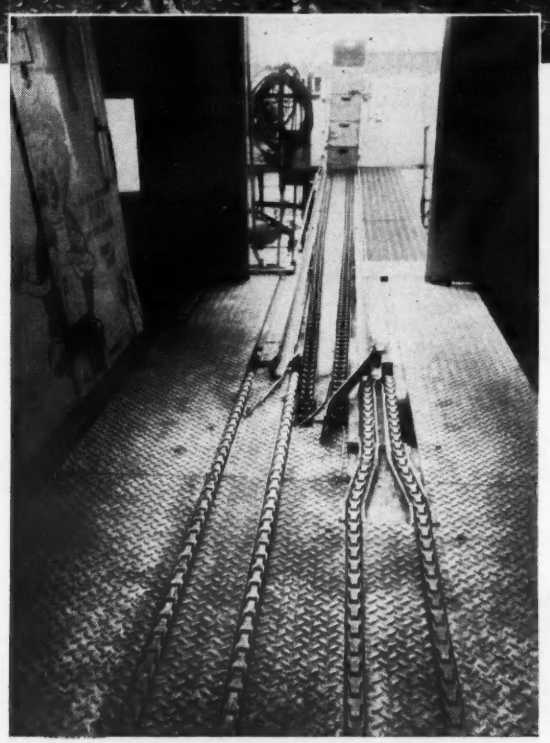
Operating in a standard two-in.-wide channel track, the chain can, as at Pevely Dairy, be embedded in existing floors or into loading docks.

Individual, flat-topped links and the swivel-joint pins are made of file-hard Promal — a Pearlitic malleable iron with special hardening for longer sliding wear.

7513 on Reader Service Slip.



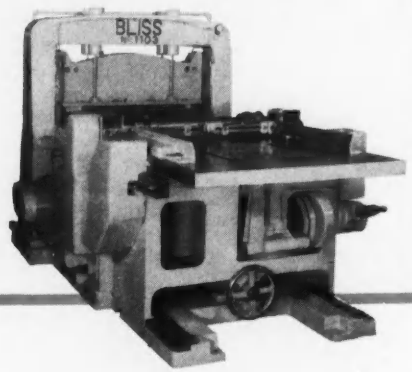
▲ In garage where wholesale trucks load, one double-strand chain conveyor (left) carries loaded cases from cold room; second chain conveyor (right) returns empties to plant. Truck-bed-level loading dock permits drivers to slide case stacks over dock floor plates and into metal-floored trucks

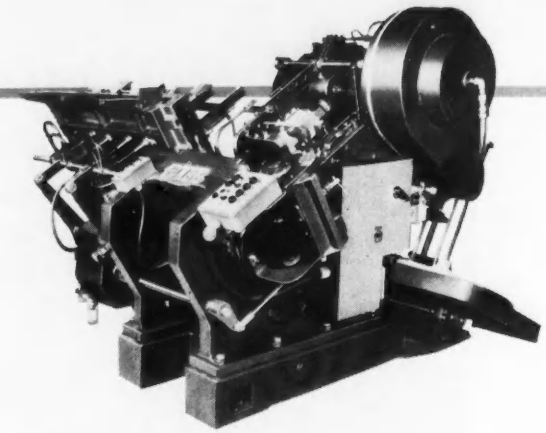


◀ Dock portion extending outside garage permits loading heavy-duty tractor-trailer units. Pintle-chain conveyor reverses, and, by switching guide-bar filled cases may be received from loaded-case conveyor (left) or empty cases returned to plant via empty-case conveyor (right)

Shown are three of five feeder lines which convey machine-stacked cases of bottled or cartoned milk to main conveyor. Switches prevent cases from jamming together as they converge on main line

New #1103 Automatic Scroll Shear offers highest production rate ever, shears both lithographed or plain sheets up to 36" square. There's no idle stroke... every stroke is a cutting stroke. First table retracts to permit regrinding of cutters with a conventional cutter grinder without taking them off.

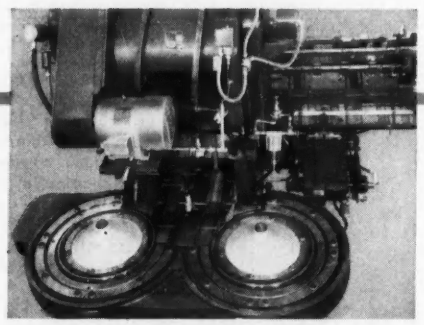




High speed #1831 Strip Feed Press blanks and forms can ends up to 404 diameter in double dies. Speeds range from 250 to 325 s.p.m. producing up to 600 or more ends a minute.

You can end CAN END production problems with these Bliss machines

(More Bliss end lines are in use than any other make)



Double end #20 Automatic Curler curls ends from 2" to 4¼" diameter; is designed for use with #1831 Strip Feed Press. Independently motor-driven, it does not rely on the press for its drive.

These machines incorporate many refinements in designs that have been thoroughly proved in production over the last four years. Write today for detailed information.

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E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.

that's interesting

Corking good idea

Bottles of corked wine are stored on their sides to prevent the corks from drying out.

Really takes the cake!

A West German baker is packaging his bread before he bakes it, reports the April issue of FOOD IN CANADA. After fresh dough is inserted into a sleeve of printed, non-moistureproof cellulose film, the open end of the package is twisted and pushed beneath the pack. The wrapped loaf then is baked, with the dough expanding to fill the bag.

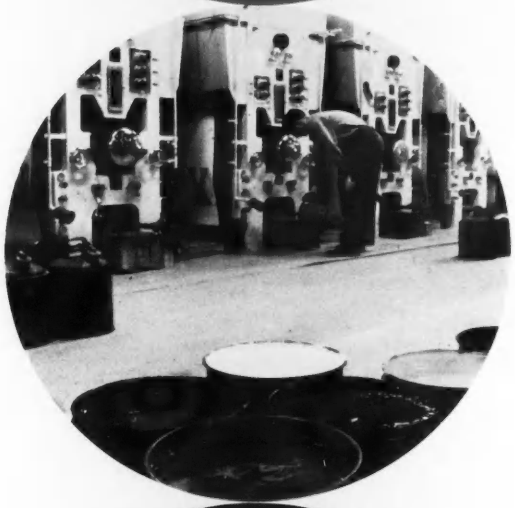
Advantages reportedly include less weight loss, longer retention of aroma, flavor and freshness and absence of mold, because mold spores are killed in baking and new spores can't get in. Also, loaves can be closer on the oven tray since they won't expand and stick together.

For more information on product at right, circle 7515 see information request blank opposite last page.

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, PACKAGING CHEMICALS, PACKAGING PAPERS

It takes more than paperboard to make

OLIN CARTONS



printing skills • modern equipment • resources • basic research • quality control • package design • dedication . . .

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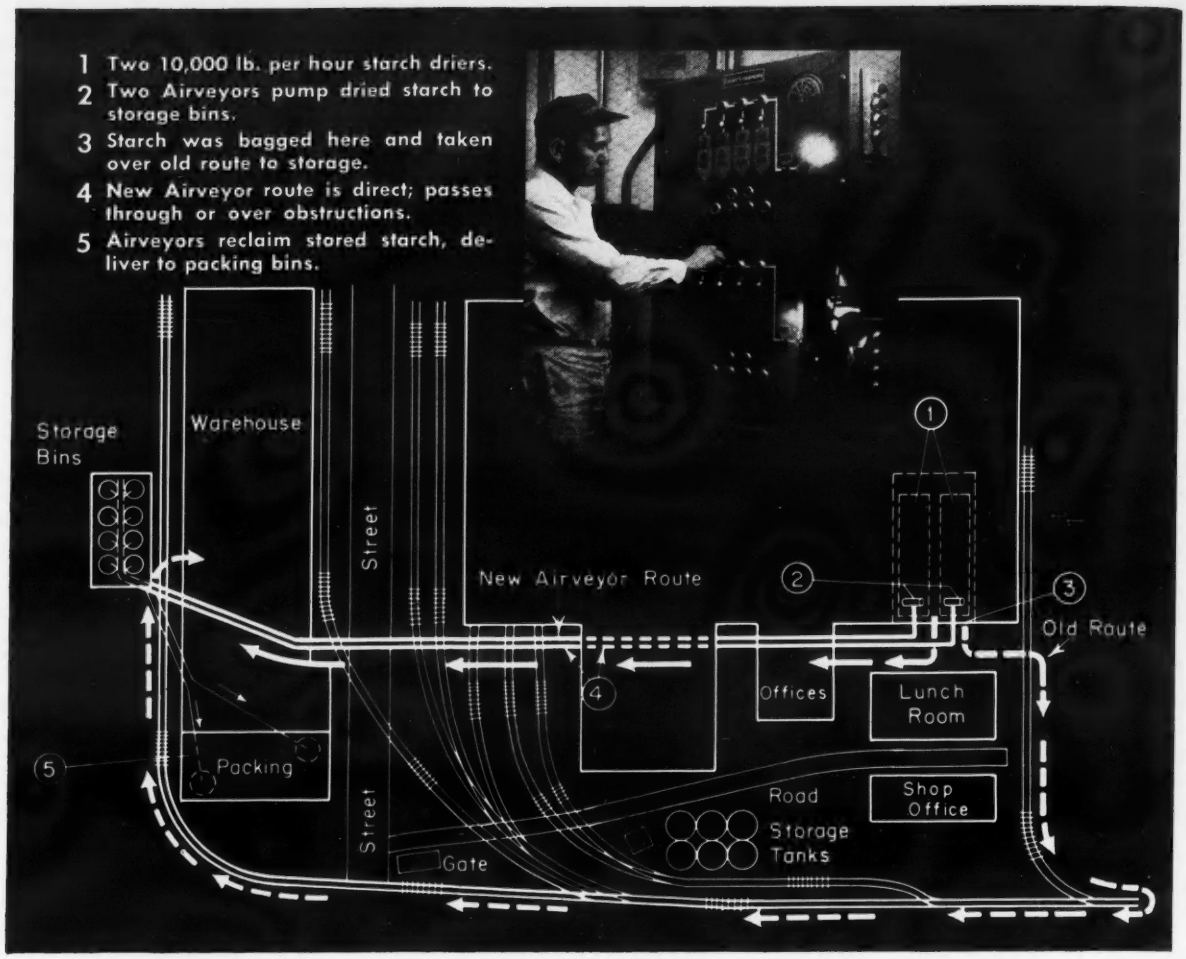
Packaging Division
P. O. Box 488, West Monroe, Louisiana

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"



PLANT MODERNIZATION THROUGH PNEUMATIC CONVEYING

FULLER pneumatic conveying system increases production without plant expansion

To increase production, the Union Starch and Refining Company's Granite City, Ill., plant first needed to expand their materials handling system. But a complete revamping of bagging and warehouse operations was impossible because there was no space available for necessary new buildings.

An Airveyor® System, engineered and built by Fuller, was the answer. Airveyor's extreme flexibility allowed it to be set up through walls, along sides of buildings, over streets, on roofs and up inclines. At Union Starch, the total distance covered is 800 feet, with a number of 45 degree and 90 degree bends in the line.

The Fuller Airveyor system transports the starch in two phases, from the driers to the storage bins and from the bins to receiving hoppers over the bagging machines. Flow is controlled automatically through control panels located in the drier room and at the bagging machines. Other controls are also provided at the panels for automatic operation of components such as feeders, blowers, conveyors and filter-receivers.

Besides being easily installed and automatically controlled, the Fuller system reduces both the amount and the expense of handling. Additional savings are made possible by Airveyor's self-cleaning facility, which greatly reduces maintenance costs.

Why not work with Fuller to design an automated pneumatic materials handling system that will help you cut costs and increase production? Write today for complete details. A-280 1358

FULLER COMPANY
GENERAL AMERICAN

FULLER COMPANY
176 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Offices in Principal Cities Throughout the World

Fuller
....pioneers in harnessing AIR

7516 on Reader Service Slip.

New belting ideal for food conveying

Uses-Features: New "Permagloss" conveyor belting's super-gloss surface, quick product release, easy sanitation, dimensional stability and chemical resistance make it ideal for food processing applications — particularly for such specialty applications as candy, baked foods and meat.

Chocolate coatings, for instance, cool rapidly because of the high Permagloss heat-transfer rate, and the shiny surface provides glossier bottoms on chocolated products.

Description: Belts contain no rubber or fabric, instead are made of Du Pont "Mylar" polyester and Firestone vinyl — a combination that provides super-strength, flexibility and long wear in a belt that will not stretch or shrink.

Permagloss belting is dimensionally stable in temperatures from zero F to 275 F, carries no taste or odor and will not absorb cocoa butter, butterfats or shortenings. The polyester is impervious to oils, solvents, alkalis and acids.

Belt will not crack, craze or embrittle; its coarse undersurface prevents slipping on drive rollers, but draws easily over supporting frames. Cost reportedly is lower than conventional belting materials.

Supplier: Lassiter Corp., 350 Fifth Ave., New York, N.Y.

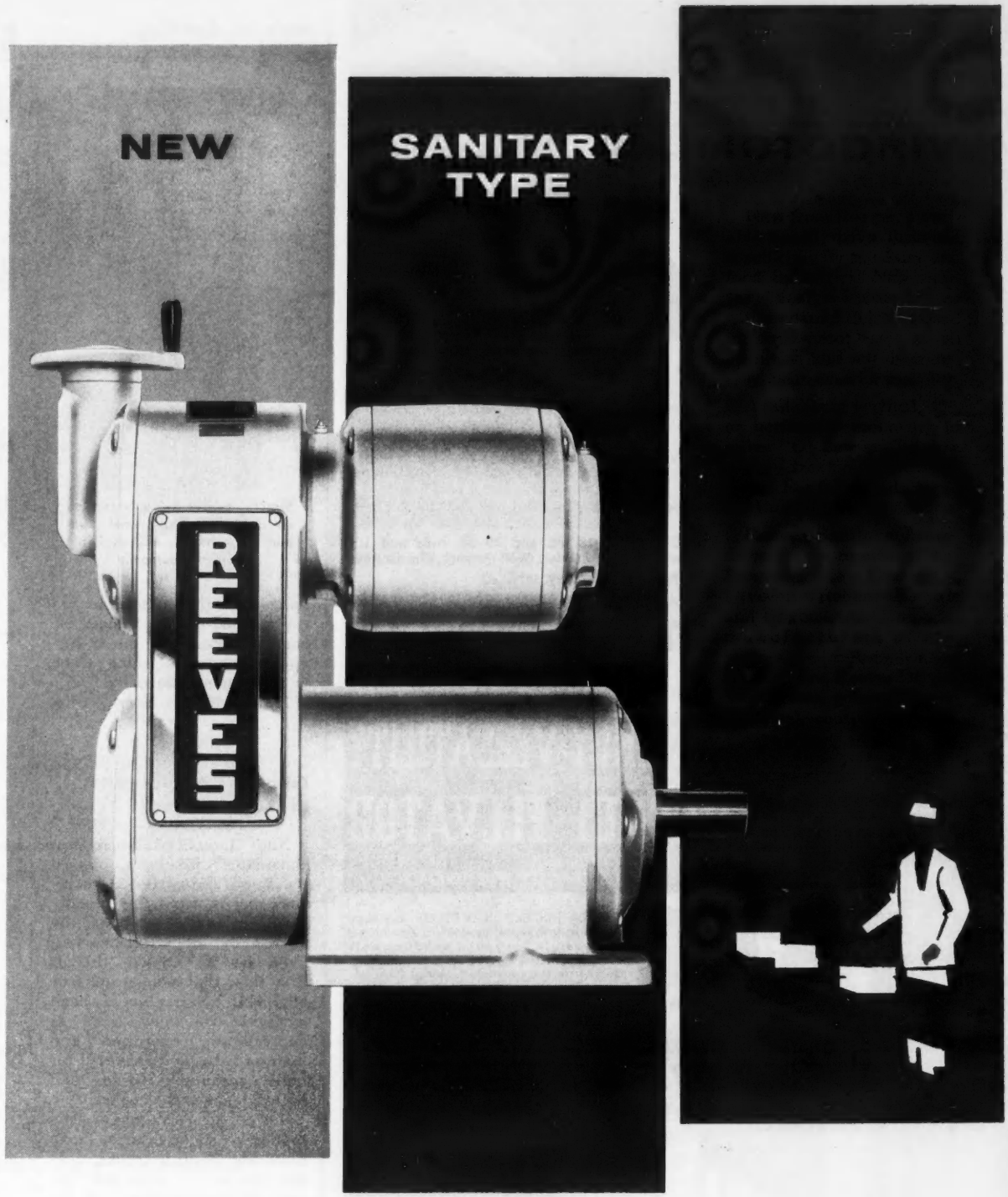
7517 on Reader Service Slip.

Add small-diam storage unit to glass-lined line

An eight-ft-diam cylindrical storage structure, glass-lined inside and out, is latest addition to A. O. Smith Corporation's Permaglas line of glass-surfaced bulk materials storage structures.

Available in 10-, 15- and 20-ft lengths, newest Harvestore unit rounds out a line which already includes larger structures of 14-, 17- and 20-ft diam, available in heights up to 50 ft. All units offer outstanding protection where stringent contamination and sanitation problems exist.

The small-diam unit is



Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.
DEPT. 676A, CLEVELAND 17, OHIO
Canadian Division: Toronto, Ontario
Sales Offices and Distributors in Principal Cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

7518 on Reader Service Slip.

end sticking

reduce down time

with **TEMP-R-TAPE®**

Temp-R-Tape eliminates sticking problems and undesirable accumulations. No materials, even those of a sticky, or viscous nature will adhere fast to its slick, wax-like TEFLON surface. Pressure-sensitive . . . it's easy to apply . . . easy to remove . . . reduces the down time involved in sprayed or baked-on Teflon surfacing. Temp-R-Tape has a useful temperature range of −100°F to 500°F. It's odorless, non-contaminating, non-absorbing and durable.

NON-STICK USES: heat sealing bars; forming plates, dies and bars; labelling rollers; chutes; hoppers; gussets; fins; guide rails.

AVAILABLE FROM STOCK: ¼" to 2" widths, 18 yd. and 36 yd. rolls and 12" widths on liner by lineal yd. Special roll widths slit to order. Sold through distributors.

FREE SAMPLE and folder — write, phone or use inquiry service.

ELECTRICAL AND INDUSTRIAL SPECIALTY TAPES

CHR **CONNECTICUT HARD RUBBER CO.**

duPont TM* **Main office: New Haven 9, Connecticut

7519 on Reader Service Slip.

DURABILITY★EFFICIENCY★VERSATILITY

ARE COMBINED TO MAKE THE

MEYER *Continuous* BUCKET ELEVATOR

ADAPTABLE TO ANY CONDITION OR CAPACITY REQUIREMENT...

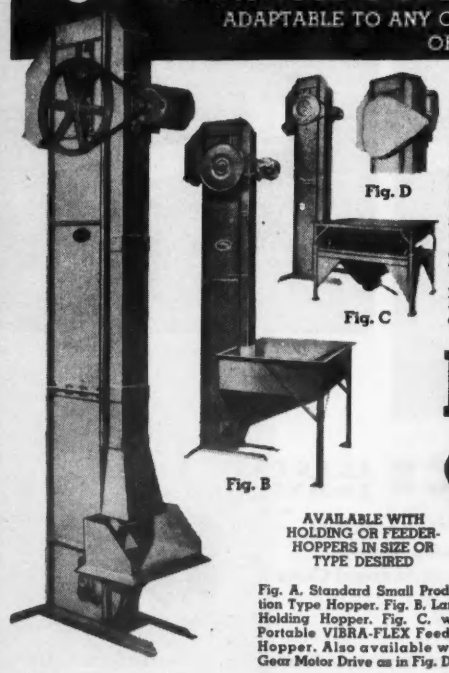


Fig. A

Fig. B

Fig. C

Fig. D

MEYER BUCKET ELEVATORS are furnished in low speed models, in any height or capacity, for gently handling bulk material without breaking or jamming. Intake design prevents material from falling into elevator boot, and positive discharge prevents inter-mixing when various products are alternately run in the same elevator. Built of heavy gauge steel with sealed, self-aligning bearings throughout for continuous heavy duty operation. They are available with Cast aluminum alloy, or fabricated stainless or mild steel buckets mounted on heavy duty roller chains.

AVAILABLE WITH HOLDING OR FEEDER-HOPPERS IN SIZE OR TYPE DESIRED

Fig. A. Standard Small Production Type Hopper. Fig. B. Large Holding Hopper. Fig. C. with Portable VIBRA-FLEX Feeder-Hopper. Also available with Gear Motor Drive as in Fig. D.

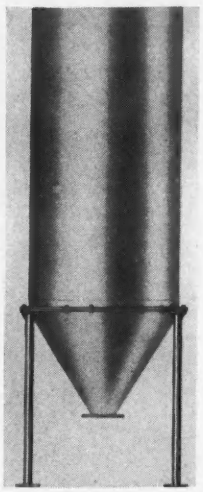
MEYER
MACHINE COMPANY
3528 Fredericksburg Road
SAN ANTONIO 1, TEXAS

MANUFACTURERS OF
CONVEYING
ELEVATING
AND
PROCESSING
EQUIPMENT

Write for Bulletin 912

7520 on Reader Service Slip.

material handling



Structures may be mounted on standard structural steel supporting members, also available from the company

flanged at the bottom to receive a 60-degree concentric cone bottom, with an 18-in.-diam discharge opening. Cone is glass-lined internally.

7521 on Reader Service Slip.

Estimate lift-truck costs in three minutes

New "Industrial Truck Cost Calculator" brochure, offered by Lead Industries Association, makes it possible to estimate, in minutes, costs incurred by industrial trucks.

So far as known, this is first time that nomographs or alignment charts have been available to show costs of depreciation, operation and maintenance accurately for both gasoline-powered and battery-powered trucks.

To perform complete estimation, truck user must know purchase price of trucks, useful life to be expected, gas and oil consumption (in the case of gas trucks), maintenance labor wage rate and replacement part costs.

Since some or all of this information may not be readily available for every plant, the brochure includes tables and values for all these factors, based on known prices and surveys of all types of truck operation.

7522 on Reader Service Slip.

HOLZ Vulco-Lagged PULLEYS

GRIP BETTER TO KEEP TRACTION.. UP UP

DRIVE HARDER TO KEEP PRODUCTION.. UP UP UP UP

WEAR LONGER TO KEEP PROFITS.. UP UP UP UP

HOLZ Vulco-Lagged PULLEYS step up performance and eliminate seasonal maintenance to save you dollars and downtime! Tough, abrasion-resistant lagging of specially compounded rubber is permanently bonded to metal pulleys for positive, non-slip driving. Pulleys run longer without relagging*; belts run longer without renewing! Have lagging applied to **your** pulleys, or order **HOLZ Vulco-Lagged Pulleys** complete. Write for detailed information today.

*Up to 10 years operation reported on HOLZ Pulleys.

"IF IT'S RUBBER, WE CAN MAKE IT!"
SERVING INDUSTRY FOR A QUARTER CENTURY

HR **HOLZ**
RUBBER COMPANY, INC.

1133 SOUTH SACRAMENTO STREET
LODI, CALIFORNIA
Dealer inquiries solicited.

7523 on Reader Service Slip.

Easy access, more compact carton grouping by wine variety and no broken-lot "cubes" have simplified warehouse inventories

Using clamp-equipped lift truck . . .

Wine 'flows' into storage fast

- **Truck unloading time cut more than half**
- **Usable warehouse space increased nearly 35%**
- **Business volume upped 18%, without added overhead**

PROBLEM: In September 1957, officials of Taylor Wine Co., Inc., Hammondsport, N.Y., decided to expedite handling of wines at their Metropolitan New York warehouse in Flushing.

Handling system then in use involved hand unloading of over-the-road trailers. It took two men from three to four hr to unload a trailer with the help of two truckmen. Cases were piled ten high.

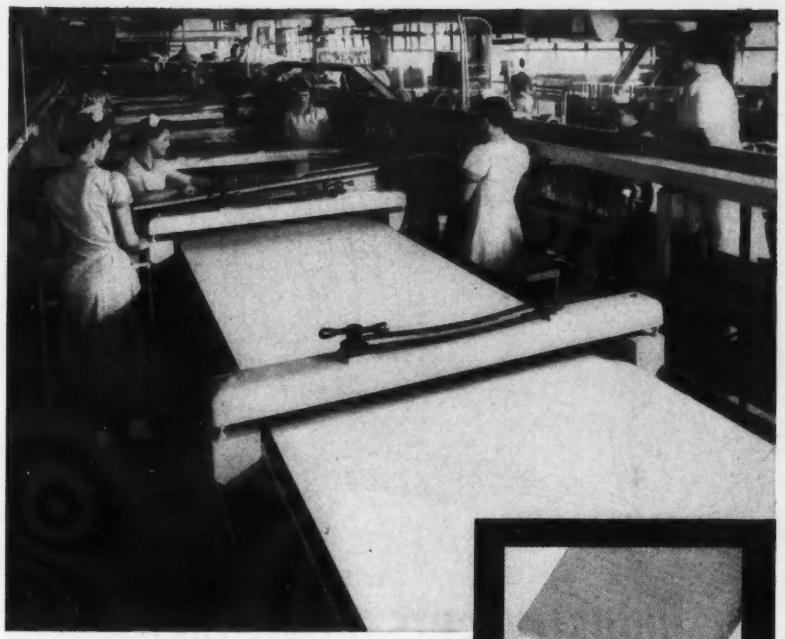
Moreover, receiving and shipping operations could not function simultaneously. Outgoing shipments had to be held up while one man helped another to unload.

While need for a lift-truck operation was indicated, palletized handling was not considered an answer "because the 1200 to 1500 pallets needed would be too costly (up to $7500), and would require additional storage space which couldn't be spared."

Solution: Company purchased a lift truck equipped with horizontal hydraulic side clamps and a side-shifter attachment.

Truck is used solely for trailer unloading and case stacking. (Since most outgoing shipments are smaller and more diversified, the lift truck is rarely needed for loading small route-trucks, and the latter operation is manual.)

Lift truck enters the trailer during the receiving operation. It takes out a "cube" at a time and conveys it to area



Why Victor 475 Conveyor Belting Is The Favorite Among Food Plants

For cleanliness that is a *must* in light food processing conveying operations – choose Victor 475 Conveyor Belting. Impregnated with Victor's own Neoprene compound, coated with Hycar, Victor 475 is a solid woven belt press-cured for a smooth surface that can't check or peel . . . resists food acids, oils and moisture . . . cleans easily with hot water.

You can choose Victor 475 Conveyor Belting, black or white, in a wide range of widths and thicknesses. Also available in Special Surface Application for specific operations.

You'll want to know more about longer-lasting, wear-resisting Victor 475 Conveyor Belting. For complete details, write today. 1667

A COMPLETE LINE, including: Neoprene Belting • Solid Woven Belting—untreated, impregnated, coated—many widths and plies • Canvas Stitched Belting • Hycar Belting • Belting Specialties.

Victor 50th ANNIVERSARY 1910-1960
Balata & Textile Belting Co.
53 Park Place, New York 7 • 300-306 W. Hubbard Street, Chicago 10
Factory: Easton, Pa.

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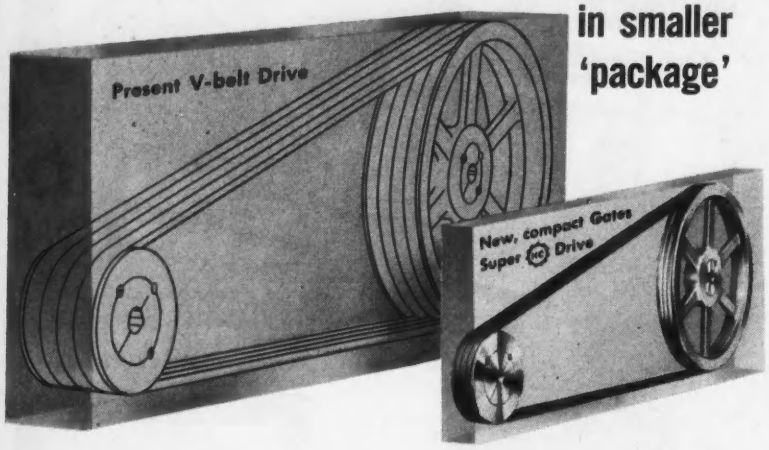
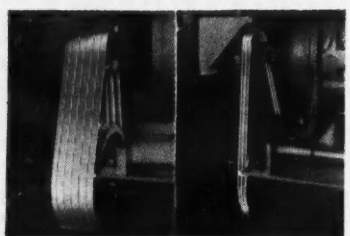


Same HP capacity in smaller 'package'

Industry cuts drive costs as much as 20% with Gates high capacity V-Belts

By putting power transmission in a smaller package, Gates 'performance-proved' Super HC V-Belt Drive has cut costs all along the line—for all kinds of industries—since its introduction more than a year ago.

As a replacement drive on equipment *inside* the plant, or as the drive on equipment *manufactured for sale* the Super HC Drive has enabled thousands of industrial users and OEM's to reduce sheave diameters 30% to 50%, overall drive space up to 50%, and drive weight 20% and more. *Initial drive cost has been cut as much as 20%.*



BEFORE ◂ AFTER ◂

COMPARE: Conventional drive at left was replaced with Gates new Super HC V-Belt Drive at right. Three of Gates new, narrow HC V-Belts do the work of the former 6 standard width belts. In this application the new drive actually takes *one-third* the space of old!

Nation-Wide Engineering Service

A Gates Distributor can show you how to effect savings with Super HC V-Belt Drives. Ask him for your free copy of *"The Modern Way to Design Multiple V-Belt Drives,"* or write to The Gates Rubber Company Sales Division, Inc., Denver, Colorado.

TPA 535

The Gates Rubber Company, Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ontario

Gates — *World's Largest Maker of V-Belts*

Gates Super HC V-Belt Drives

7525 on Reader Service Slip.

where that variety is kept on the storage floor. (The storage system is arranged by grouping each of the 17 Taylor Wine varieties together.

Average load cube carried to storage by the lift truck is 52 cases, or 1924 lb — never heavier. Loads are stacked 12 tiers high — leaving an appreciable clearance between ceiling and top of cases.

Average trip is 300 ft, and an average of 200 trips are made each day.

Number of hours of daily lift truck operation depends on frequency of incoming shipments. Average would be two hr per day, or ten hr per

One man now unloads trailer three to four times as fast as two men previously unloaded

wk. However, when incoming shipments reach a peak, unit may be in use a full eight hr.

On the other hand, during the two-month pre-Christmas busy season, when much of the operation is concerned with outgoing shipments, use of the lift truck is appreciably less.

Results: Where previously it took two men from three to four hr to unload a trailer, it now takes one man 55 min — a reduction in unloading man-hours from six-to-eight down to less than one.

The lift truck requires ten-ft aisles for maneuvering in place of the previously needed six-ft aisles. However, with 12-high stacking replacing 10-high, over-all result has been a decided increase — between 35 and 40 per cent — in usable storage space.

Where previously 36,000

BY simply removing a cross wire or two with a pair of pliers, you can take out, add to or replace one or more sections of La Porte Belts. It takes only a few minutes and the belt need not be taken from the La Porte Drive Sprocket. The cross wires are readily replaced and downtime is held to a minimum.

But there are other money-saving advantages of La Porte Flexible, open-mesh construction. It speeds up drainage, it facilitates sterilizing with a steam gun. It permits the circulation of air and liquids around products in process. And prevents products from rolling off. La Porte Belts are built for long service and are easily installed.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124 Dept. A
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

7526 on Reader Service Slip.

cases of wine could be stored, 60,000 cases now can be accommodated. Further, traffic and handling have been speeded up as a result of wider aisles, and a greater volume can be handled in less time than previously.

As result of the gain in space, a work area 20 by 100 ft has been created. Here, small lots of each variety are grouped and readily accessible for speedier outgoing shipment.

Shipping and receiving operations now can function simultaneously. Outgoing shipments need no longer be held up while one man helps another to unload.

Company has been able to increase business handled by its Metropolitan New York warehouse by 18 to 20 per cent, without increasing overhead expenses in the form of additional help or overtime pay to the two-man work force.

In other words, the same two men who previously handled shipments now handle the considerably increased volume with help of the lift truck.

(Towmotor Model 460 lift truck with side-shifter attachment, in operation at Metropolitan New York warehouse of Taylor Wine Co., Inc., is manufactured by Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.)

7527 on Reader Service Slip.

("Cascade" hydraulic horizontal clamp attachment for palletless lift-truck handling is manufactured by Little Giant Products, Inc., 1540 N. Adams St., Peoria, Ill.)

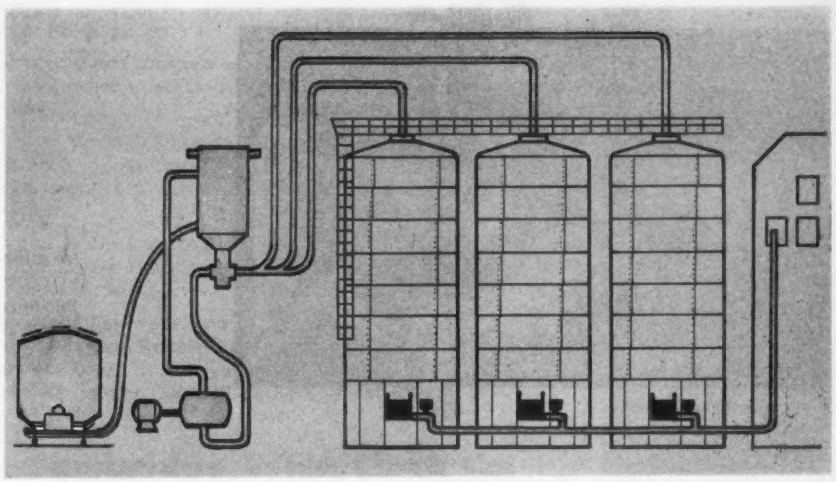
7528 on Reader Service Slip.

Conveyor measures up to height changes as needed

Uses: Conveyor is designed for all package conveying, but particularly for handling filled bags from weighing and packing equipment through the sewing operation.

Features-Description: An adaptation of the company's Model GA-11 bag conveyor, which allows changes in length from seven to 12 ft, new unit's

Here's a "TRIPLE-THREAT" to the high cost of handling bulk materials



Here's a typical vacuum-pressure system for Permaglas Storage Units. A. O. Smith distributors have the "specialized" know-how to plan and help solve your bulk materials conveying problems.

Permaglas® *Storage Structures*

...mechanical "sweep-arm" bottom unloader

...pneumatic conveying system

Permaglas Mechanized Storage Structures offer a "dynamic challenge" to the higher cost, conventional methods used in handling and storing of bulk materials. You can realize lower costs in your processing operations when *slow and expensive* methods are replaced with *Permaglas* Mechanized Storage Units. Equipped with the *exclusive* "sweep-arm" mechanical bottom unloader, they can be incorporated into an efficient pneumatic or mechanical conveying system. Here's how you benefit:

- A completely enclosed, "push button controlled" bulk materials handling system is now possible.
- Incoming "bulk" cars or trucks can be unloaded pneumatically or mechanically directly into the *Permaglas* Storage Structure.
- The mechanical "sweep-arm" bottom unloader discharges bulk materials directly into the conveying system to the process lines.
- This means substantial savings in labor, eliminates bags, bins, barrels, handling equipment and the maintenance of this equipment . . . eliminates material losses by breakage or spillage . . . helps prevent hazardous accidents.
- *Plus this exclusive feature. Permaglas* Storage Structures are glass-fused-to-steel construction* both inside and out. Makes possible sanitary, easy to clean bulk materials handling systems. Eliminates corrosion, safeguards products from contamination and infestation. Reduces structure maintenance to a minimum.

This low cost way to handle and store bulk materials can be accomplished with minimum capital investment. Certainly it is worth further investigation. Mail coupon for details.

Through research . . . a better way

A.O.Smith
CORPORATION
HARVESTORE PRODUCTS DIVISION
KANKAKEE, ILLINOIS
A. O. Smith International S.A., Milwaukee 1, Wis.

A. O. SMITH CORPORATION
Permaglas Storage Units, Dept. FP-60
Kankakee, Illinois
Send me free Permaglas Mechanized Storage Unit Bulletin MU-107.
Name.....
Title.....
Company.....
Address.....
City.....Zone....State.....

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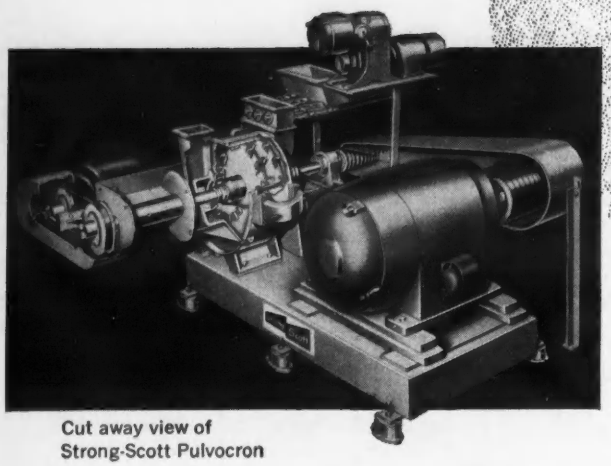


Cut away view of
Strong-Scott Pulvocron

Magnified Sample of
SITOSTEROLS
Pulverized to
minus 10 microns

Pulverizing with Selective Particle Size Control!

INCREASE PRODUCTION AND CUT OPERATING COSTS WITH THE NEW PULVOCRON

Because this unit is so versatile, it can pulverize hard or soft materials and can operate in the extreme fineness range (95 to 99% finer than 5 to 10 microns) or it can operate in the coarse particle size range (50 mesh and thereabouts).

The Pulvocron is now being used to solve many size reduction problems in the chemical, food and related process industries. Available in 20 and 38-inch grinding chambers and constructed of carbon or stainless steel.

SPECIAL FEATURES

- **Pulverized product particle size control**
- **Pulverized product temperature control**
- **Installation versatility**
- **Accessibility for inspection**
- **Sturdy construction for years of service**

THE PULVOCRON IS AN ADVANCED IMPACT AND AIR ATTRITION PULVERIZER COMBINED WITH INTERNAL PARTICLE SIZE CLASSIFIER.

TYPICAL INSTALLATIONS USING 20″ PULVOCRON

Product	Soya Sitosterols
Feed Material .	40 Mesh (Approx.)
Pulverized . . .	99.99% minus 10 microns
Capacity. . . .	500 lbs. per hr.

Product	Urea Formaldehyde
Feed Material .	¼ to ⅜″ Diameter
Pulverized . . .	99% minus 80 Mesh
Capacity. . . .	1600 lbs. per hr.

Consult Strong-Scott with your pulverizing problems

The **Strong Scott** Mfg. Co.

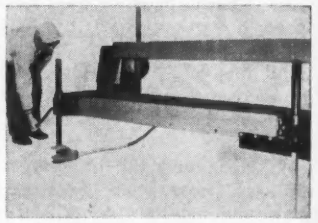
451 Taft Street N. E., Minneapolis 13, Minnesota • Phone: STerling 1-7461

EQUIPMENT DESIGNED FOR BETTER PROCESSING

7530 on Reader Service Slip.

standard height of eight in. can easily be jacked by one operator to any position within a 12-in. range.

Adjustable features contribute to simple installation. Also, when changes in production layout are required, the conveyor is readily adaptable to smaller or larger space situations.



All bag sizes may be conveyed, as there are no obstructions or confining braces

Surface of belt is absolutely flat, since belt rides on flat metal skid plates.

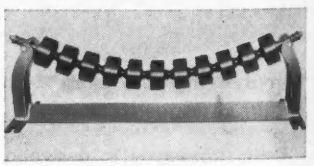
(New height- and length-adjustable flat belt conveyor is manufactured by Richardson Scale Co., Clifton, N.J.)

7531 on Reader Service Slip.

Gives belt true suspension under all load conditions

A new catenary conveyor carrier, known as "Flexiroll," which provides true catenary suspension for the conveyor belt under all load conditions has been developed by Stephens-Adamson Manufacturing Co.

Carrier features a high-tensile spring-steel "dead shaft" to which is mounted a mild steel trunnion and a shock-absorbing compression spring.



All-steel jig welded frame is self-cleaning, as is the roller assembly

The shaft has an initial set, providing a trough which enables the most rigid of belts

to make contact with the face of all rollers when the belt is running under all load conditions.

Consequently, the Flexiroll Carrier supports the belt in a natural arc, contributing to more efficient belt training and reduced belt wear.

Greater strength than conventional catenary carriers is provided through use of the solid spring-steel shaft rather than a steel cable which is subject to breakage through the constant flexing action.

The carrier rollers resist reaction to corrosive, abrasive, greasy, oily and combustible materials. Natural flexing action of the carrier reduces material breakage, spillage and material build-up.

Flexiroll Carrier is available for 18-, 20-, 24-, 30- and 36-in. belt widths.

7532 on Reader Service Slip.

100 ways to cut packing, shipping costs

An even hundred specific suggestions for cutting costs in packing, shipping and in the stockroom are given in special 12-pg research report, "100 Ways to Save Money in Packing, Shipping and Stockroom Operations," prepared by Manpower, Inc.

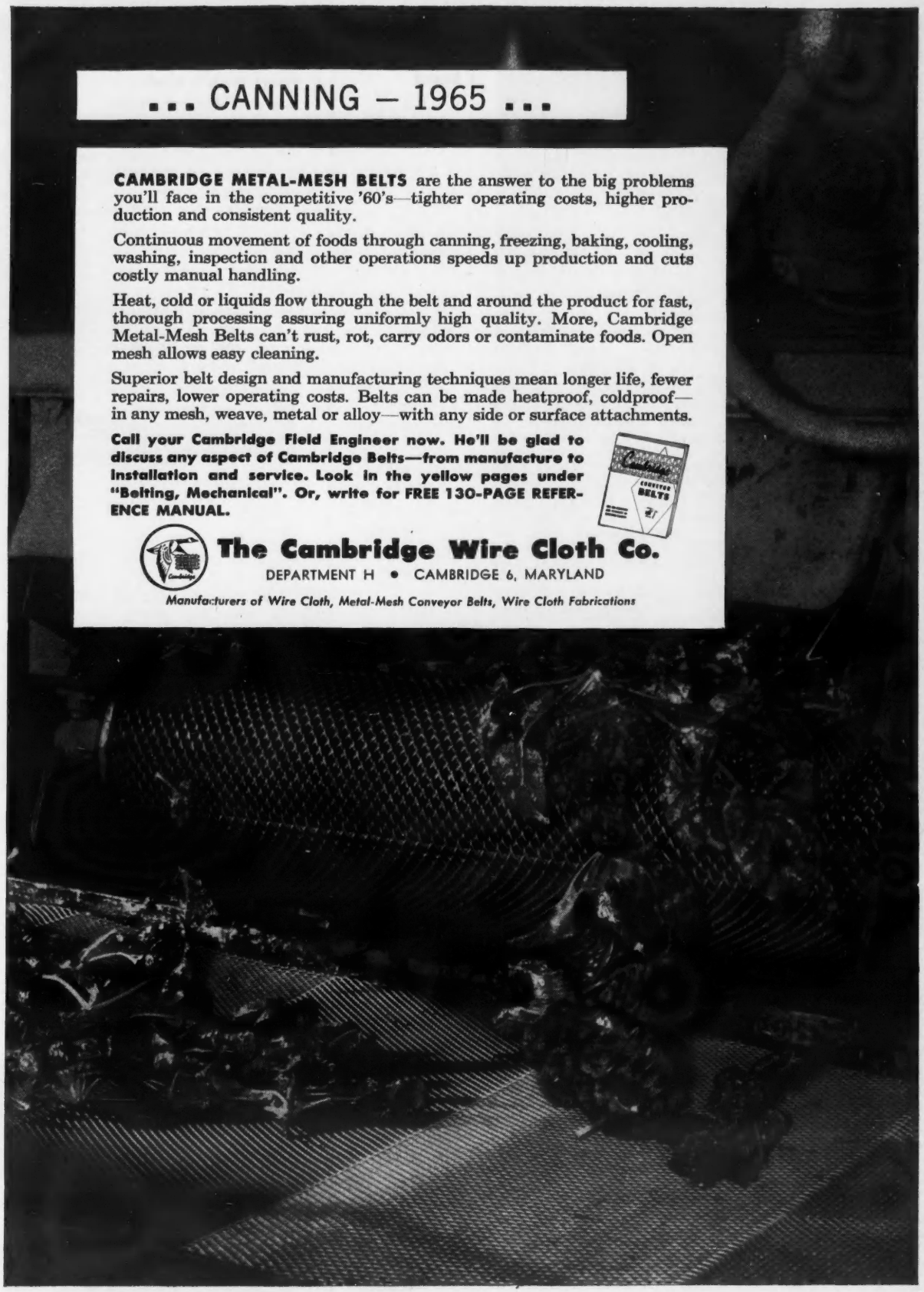
The ideas, gathered from experts in these phases of plant operation, are divided into sections: general administration, packing, shipping, packaging, warehousing, public warehousing.

The tips comprise a guide on equipment, employee and administrative problems of interest at all levels of operation.

7533 on Reader Service Slip.

GET CURRENT LITERATURE

A quick reference to technical literature available this month is given in the classified listing of new literature, page 115 of this issue. Check it now.


... CANNING – 1965 ...
CAMBRIDGE METAL-MESH BELTS are the answer to the big problems you'll face in the competitive '60's—tighter operating costs, higher production and consistent quality.
Continuous movement of foods through canning, freezing, baking, cooling, washing, inspection and other operations speeds up production and cuts costly manual handling.
Heat, cold or liquids flow through the belt and around the product for fast, thorough processing assuring uniformly high quality. More, Cambridge Metal-Mesh Belts can't rust, rot, carry odors or contaminate foods. Open mesh allows easy cleaning.
Superior belt design and manufacturing techniques mean longer life, fewer repairs, lower operating costs. Belts can be made heatproof, coldproof—in any mesh, weave, metal or alloy—with any side or surface attachments.
Call your Cambridge Field Engineer now. He'll be glad to discuss any aspect of Cambridge Belts—from manufacture to installation and service. Look in the yellow pages under "Belting, Mechanical". Or, write for FREE 130-PAGE REFERENCE MANUAL.
The Cambridge Wire Cloth Co.
DEPARTMENT H • CAMBRIDGE 6, MARYLAND
Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

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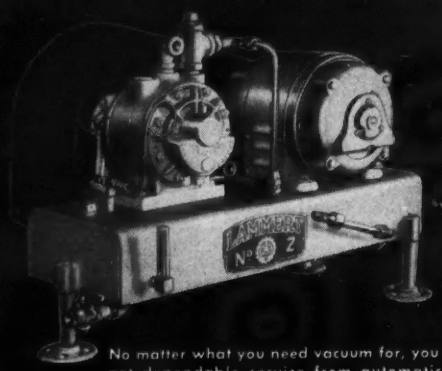
VACUUM

LAMMERT PUMPS



No matter what you need vacuum for, you will get dependable service from automatically lubricated Lammert pumps. Capacities—4.3 to 225 cubic feet per minute. From medium to high vacuum (up to 20 microns of barometer).

Write for catalog showing the complete line, including specifications, of Lammert pumps and compressors.

LAMMERT & MANN CO., INC.
1753 Walnut Street, Chicago 12, Illinois, SEeley 3-0383

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food processing

a Putman-Style magazine

featuring all these unique elements:

- TERSE, VITAL EDITORIAL
- HAND-PICKED CIRCULATION
- 'EXECUTIVE' FORMAT
- QUALITY READERSHIP
- HIGH READER ACTION

fp TRANSPORTATION

Short-length truck has unitized structure

Uses-Features: For retail delivery, ½-ton truck is only 14 ft long, has payload area of 243 cu ft.

Truck's body and chassis are fabricated as solid, unitized structure. It has a wheelbase of only 98 in., and can therefore make 18-ft radius turns.

Floor of truck body is only two ft above ground

Description: Body of truck has wide rear doors, 5½ ft high sliding side doors and insulated roof.

Truck is powered by 6-cylinder engine which develops maximum of 133 hp.

(GMC Junior Van is made by GMC Truck & Coach Division, General Motors Corp., 660 S. Boulevard East, Pontiac 11, Michigan.)

7537 on Reader Service Slip.

Brochure graphically portrays practical concept of road, rail or ship . . .

Integrated transport system

The concept of containerization and the functioning of the specific Fruehauf-GATX Container Program are described and illustrated in new 14-pg booklet entitled "The Fruehauf General American System."

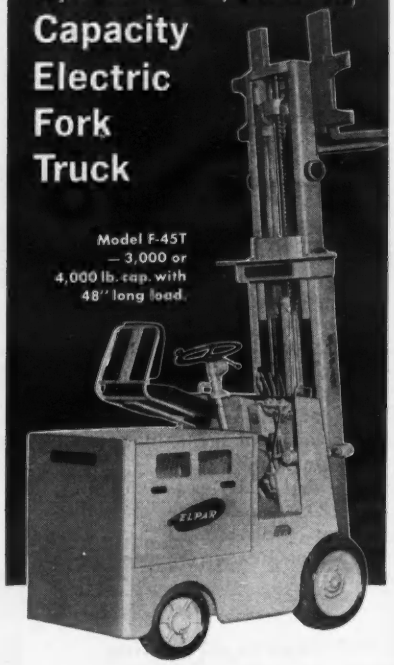
Booklet gives details of applications, operating principles, advantages and general specifications of system's three

(*Continued on page 80*)

ELPAR

3,000 & 4,000 lb. Capacity Electric Fork Truck

Model F-45T — 3,000 or 4,000 lb. cap. with 48" long load.



PRICED TO FIT ANY BUDGET

The ELPAR F-45T is priced competitively yet offers the ultimate in quality that's traditional with all ELPAR electric trucks. Check these advantages:

- **Fast Travel and Lift**
- **Compact and Maneuverable**
- **Tough and Dependable**
- **Outstanding Safety**

And, it's economical. The F-45T operates on only pennies per day and is designed for fast, easy maintenance.

AVAILABLE FOR FAST DELIVERY

Write for your F-45T catalog today!

ELPAR
ELECTRIC TRUCKS

The ELWELL-PARKER Electric Company
4003 St. Clair Avenue • Cleveland 3, Ohio
In Canada: Industrial Equipment Co., Ltd.

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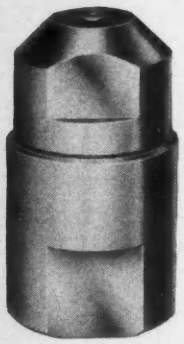
NOW SPRAY DRYING NOZZLES WITH CERTIFIED PERFORMANCE FROM DELAVAN
WORLD'S LARGEST NOZZLE MANUFACTURER



Delavan's new SDL and SDS nozzles provide an economical and uniformly reliable method of atomizing for spray drying. The special design features of this nozzle bring you improved performance, easier installation, longer nozzle life, and reduced maintenance.

CERTIFIED PERFORMANCE
Delavan orifices and distributors are accurately calibrated and certified to operate within ± 5% of rated capacity when tested on water at 1000 psi. All spray angles are certified to be within ± 5° of rated spray angle. This accurate quality control is your assurance that every Delavan orifice and distributor, whether purchased as a set or individually, will perform as rated in the catalog.

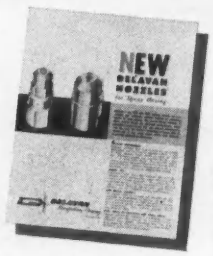
EASY NOZZLE ASSEMBLY
No special tools or fixtures are required for the assembly or dis-assembly of Delavan nozzles. The orifice and distributor are held securely in position by a screw pin which is easily removed for cleaning or replacement. This feature reduces nozzle maintenance costs.

WIDE CHOICE OF CAPACITIES AND SPRAY ANGLES
Delavan nozzles are available in a full range of flow rates and each flow rate can be furnished as standard in four different spray angles. Matching flow rate and spray angle in your dryer can often mean greater efficiency and a better end product.

DELAVAN Manufacturing Company
WEST DES MOINES, IOWA

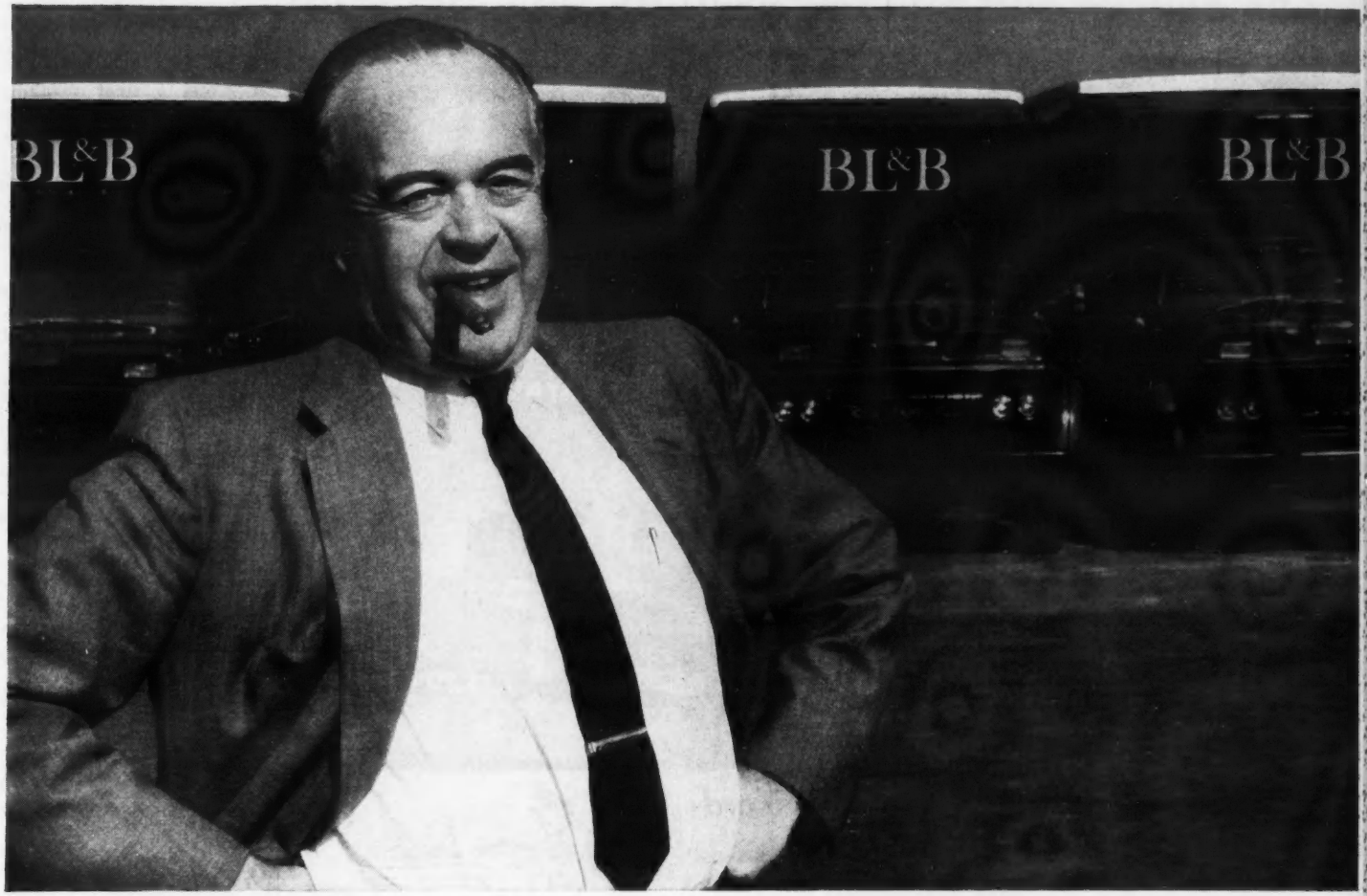
Gentlemen:
Please send me a copy of your Spray Drying Catalog.
I understand there's no obligation.

Name
Company Name
Address
City Zone State



7536 on Reader Service Slip.

"I just got $42,000 worth of new trucks without tieing up one dollar of my money!"



Conserve capital. Take delivery on a new Hertz truck fleet and forget about high purchase costs and interest rates. What's more, you don't have to disturb your capital. It stays on the job, profitably at work for you in other parts of your business.

You get new GMC, Chevrolet or other sturdy trucks, custom-engineered to fit your needs. Or we'll buy your present trucks, rebuild them if necessary, and lease them back to you. Furthermore, Hertz provides extra trucks for peak periods or emergencies.

Hertz experts take over all repairs and upkeep.

You eliminate all your truck problems by writing one budgetable check per week. There's no easier way to get out of the truck business and back into your own business! You can deal confidently with Hertz, America's largest and most experienced truck lessor.

For more information, call your local Hertz truck office. Or write for a free copy of the fact-filled booklet, "How to Get Out of the Truck Business," to Hertz Truck Lease, Dept. N6, 218 South Wabash, Chicago 4, Ill.

HERTZ TRUCK LEASE ®

NO INVESTMENT... NO UPKEEP

LEASE HERTZ TRUCKS

HERTZ ALSO RENTS TRUCKS BY THE HOUR, DAY OR WEEK

7539 on Reader Service Slip.

NEW CATALOG Describes Latest Developments in Waste and Refuse Storage and Removal

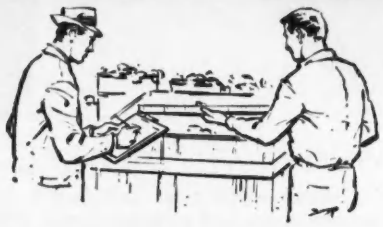
New Techniques Cut Cubic Yard Removal Costs to Record Low

This new 28-page color catalog describes remarkable new developments in waste control and disposal that have, within the last two years, obsoleted many systems now in use. Cubic yard handling costs have been reduced to a point where many firms and municipalities are saving thousands of dollars annually that they were previously spending to operate old-style equipment.

Materials handling and waste disposal are two of the few areas of large potential cost reduction remaining in manufacturing and municipal administration. This new catalog has a bearing on both of these areas of operation.

To get your copy of this new fact-filled catalog, write today.

DEMPSTER BROTHERS
Inc.
DEPT. FP-6 KNOXVILLE 17, TENN.



FREE SURVEY WITHOUT OBLIGATION
Dempster Field Engineers, located in all sections of the country, make thousands of cost-finding refuse storage and collection surveys every year, without cost or obligation. If you would like to know your disposal costs, and what—if any—avenues of improvement exist, write today on your letterhead.

28 Page Catalog FREE

Dempster Brothers, Dept. FP-6
Knoxville 17, Tennessee
Please Send New Catalog Brief 160
Name _____
Title _____
Firm _____
Address _____
City _____ State _____

7540 on Reader Service Slip.

transportation

(*Continued from page* 78)

basic elements—container, chassis and G-85 rail car.

Container is adaptable to road, rail or ship. Available in five different combinations of steel or aluminum, its major components are interchangeable with the Fruehauf Volume-Van Trailer.

Specially designed chassis, available in lengths to match containers, and with easy locking and unlocking devices, are designed for service on highways or city streets alike.

Third basic component of the system—General American's G-85 rail car—is designed for both container and piggyback service. The G-85's weight and design features, tie-down system and shock-absorption qualities are fully presented.

Also discussed are the Fruehauf General American System's speed and flexibility in roll-on, roll-off, lift-on, lift-off and other loading and unloading methods, as well as its possibilities for assembly line feeding.

7541 on Reader Service Slip.

How to design your loading dock and yard

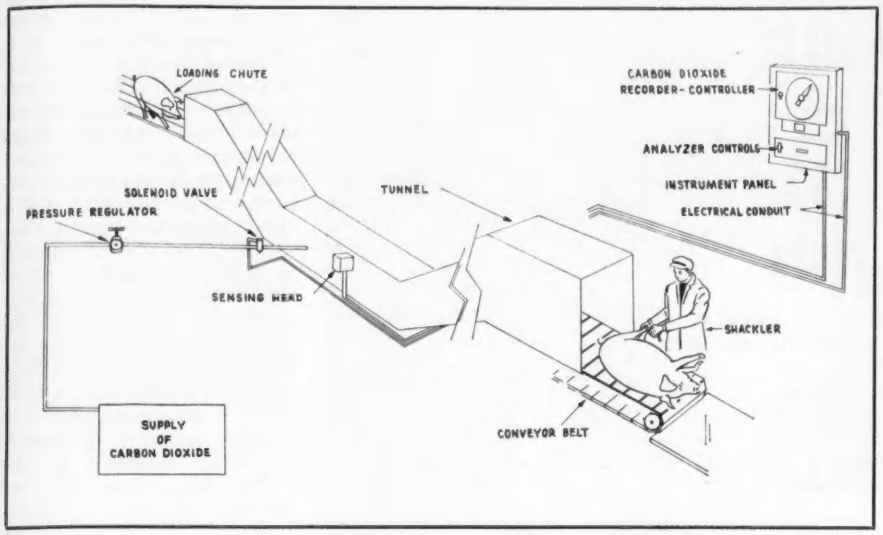
. . . for better shipping and receiving

Efficiency ideas and minimum design standards important when planning new truck loading facilities or improving existing set-ups for speedier in-and-out movement are presented in eight-pg booklet, "Loading Docks and Yards," offered by the Kelley Co., Inc.

Compiled from information published by the American Trucking Association, Truck Trailer Manufacturers Association, Society of Automotive Engineers, etc., booklet's text and illustrations cover such subjects as the yard approach, dock apron area, truck spotting positions in front of dock and the loading platform.

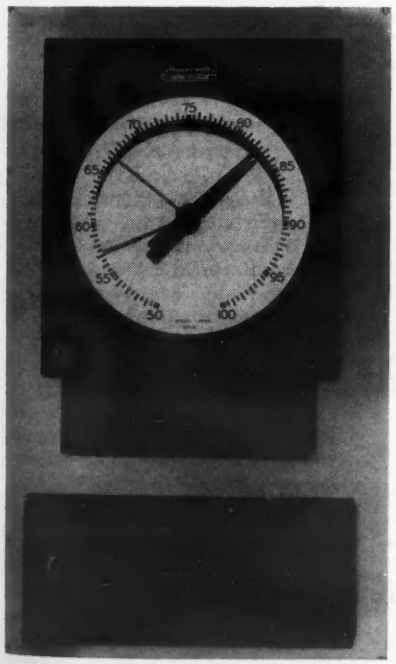
Final section presents basic information designed to help in selecting the loading ramp equipment best suited to specific needs.

7542 on Reader Service Slip.



To place analyzer-controller into operation at start of kill, switch on instrument is closed a few minutes before slaughtering begins. Tunnel fills automatically with gas

Controls CO_2 concentration in immobilization to ± 1%



WHEN immobilizing with carbon dioxide, too low a cencentration will not render animals unconscious; will therefore result in non-compliance with Humane Slaughtering Law (see page 29). Too high a concentration will cause death at wrong moment in process; will result in improper bleeding.

Optimum carbon dioxide concentration for hog immobilization is typically 72 per cent although optimum concentration will vary from 65 to 75 per cent depending upon rate of kill and weight of animals.

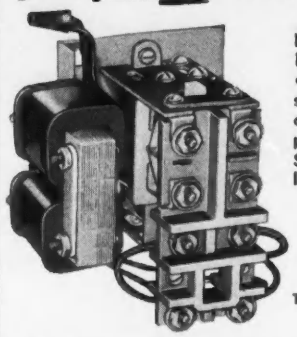
Control system, available from Thermco Instrument Corporation, La Porte, Ind., controls gas content to within 1 per cent, or from 72.72 to 71.28 per cent (when desired concentration is 72 per cent).

System automatically controls and records CO_2 concentration. It has a sensing head that is mounted on wall of depressed

◀ According to MID, USDA brochure, sampling of gas for analysis must be made from representative place within chamber on continuous basis. Gas concentration must be graphically recorded during each day's operation

WARRICK
Floatless, Electrode Type
LIQUID LEVEL CONTROLS

give you all these advantages!



No moving parts in the liquid • Easy to install • No adjustments necessary • Unaffected by acids or caustics • Unaffected by pressure or temperature • Standard 2&3 pole units listed by U/L

Write for 32-page Catalog which gives complete specifications

Two pole control shown at left

YOU CAN USE OUR CONTROLS FOR:
- Single & multiple pumps
- Motor & solenoid valves
- High & low cutoffs & alarms
- Evaporators
- Pressure vessels
- Storage tanks
- Waste sumps

Special controls to custom requirements

CHARLES F. WARRICK CO.
1964 W. Eleven Mile Road, Berkley, Michigan
Dept. 15 Telephone JOrdan 4-6667

7543 on Reader Service Slip.

ELECTRONICS TIME
Lumenite
AUTOMATIC CONTROLS

- ELECTRONIC LIQUID LEVEL
- INDUSTRIAL TIMERS
- TIME SWITCHES
- MAGNETIC SWITCHES
- ELECTRONIC SWITCHES

Your business is of first importance, therefore, all LUMENITE manufacturing and engineering are devoted to the sole production of Controls. In the following list of Bulletins there is a Control best suited to your operation in a money making and saving way.

For complete information and prices check ☑ the Bulletins you want. We'll send them without obligation. Tear out the ad and use it for your requests.

The Bulletins are technically informative; with load capacities, installation diagrams, etc.

☐ TIME SWITCHES
☐ PROGRAM CLOCKS
☐ CYCLE REPEATERS
☐ TIME DELAY RELAY
☐ AUTO-LAWN SPRINKLERS
☐ LIQUID LEVEL
☐ MILK LEVEL
☐ NONCONDUCTIVE LIQUID
☐ AUTOMATIC RESET
☐ ICE THICKNESS
☐ BOILER LEVEL
☐ MOTORIZED SANITARY VALVES
☐ INTERVAL TIMERS
☐ PHOTO-ELECTRONIC RELAYS-COUNTERS, ETC.

All LUMENITE products have a responsible guarantee

LUMENITE ELECTRONIC CO.
ENGINEERS • DESIGNERS • MANUFACTURERS
407 South Dearborn Street Chicago 5, Illinois

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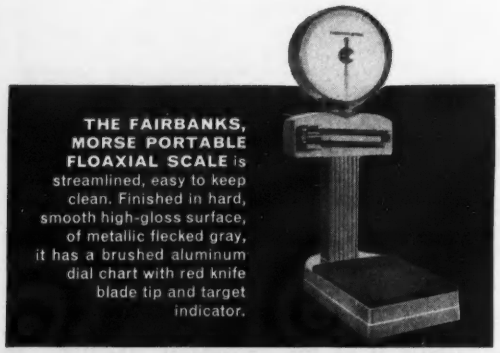
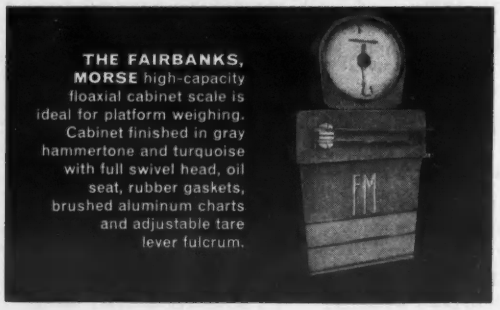
add
the
weight
of
130
years
experience
for
quality
you
can
count
on



THE FAIRBANKS, MORSE PORTABLE FLOAXIAL SCALE is streamlined, easy to keep clean. Finished in hard, smooth high-gloss surface, of metallic flecked gray, it has a brushed aluminum dial chart with red knife blade tip and target indicator.



THE FAIRBANKS, MORSE high-capacity floaxial cabinet scale is ideal for platform weighing. Cabinet finished in gray hammertone and turquoise with full swivel head, oil seat, rubber gaskets, brushed aluminum charts and adjustable tare lever fulcrum.

BY ANY SCALE OF VALUES it's accuracy and adaptability to your own needs that counts when you're selecting weighing apparatus. Fairbanks, Morse is the one company uniquely equipped to meet your requirements. For since 1830 we have been designing dependable equipment for industry, until today F-M is the world's largest manufacturer of scales and automated weighing systems.

Today we proudly present a wider line, ranging from baby scales to electronic weighers that will accommodate entire trains! There are models for countless industrial applications . . . including **yours!**

Yet diverse and intricate as these applications may be, every F-M scale, every weighing accessory incorporates the built-in trademarks of F-M engineering skill and integrity . . . **utmost accuracy, ruggedness, long life . . . plus ease of service and simplified maintenance.**

Whether your weighing needs are mechanical or electronic . . . for Floaxial Printomatic weighers—or simply a health scale for your First Aid Department, you can look to Fairbanks, Morse for the right answer. Remember, the oldest, most experienced company is in business to find the **newest** ways to serve you!

Fairbanks, Morse

Scale Division • Fair Lawn, New Jersey

A MAJOR INDUSTRIAL COMPONENT OF **FAIRBANKS WHITNEY CORPORATION**

7545 on Reader Service Slip.

portion of tunnel, see diagram. Power supply box and recorder-controller can be installed on remote panel.

Sensing head contains analyzer which detects actual amount of carbon dioxide. Head relays electric signal to control panel where concentration is graphically recorded as percentage. Signal is also relayed to solenoid valve so that flow will be adjusted to maintain concentration at set-point level.

Operation of analyzer depends upon thermal conductivity of carbon dioxide. Four wires are mounted in a brass block inside sensing head. Two of the wires are surrounded by continuous passage of gas while the other two are mounted in an air reference.

One of the wires for gas sampling is hot. Amount of heat carried away by carbon dioxide is a function of its concentration. Change of hot-wire temperature, indicating change of concentration, unbalances Wheatstone bridge in circuit. Amount bridge is unbalanced is measured and calibrated as per cent CO_2.

7546 on Reader Service Slip.

Controls valves, dampers automatically to prevent motor overloads

Aids in keeping electric demand charge below "penalty" limit

Uses: For limiting maximum current on any electrical motor-driven device which is pneumatically controlled, especially centrifugal refrigeration compressors.

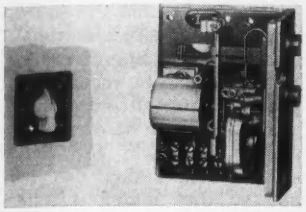
Features: Relay limits opening of capacity regulating inlet valve or damper so that current does not exceed a predetermined maximum amount, regardless of demands of other controllers.

Current-limiting feature makes controller also useful in preventing electric demand charges during periods of less than maximum load.

Description: Relay is in-

stalled in pneumatic control circuit and responds to motor current. It can operate at any current between three and seven amperes, and when used with proper transformer, can be applied to motors of any size.

Motor current is set manually to any selected value be-



Maximum motor current is dialed on controller; can be set from 40 to 100 per cent of motor load

tween 40 and 100 per cent of maximum by an adjuster which may be mounted in any convenient location.

Secondary winding of current transformer energizes coil of relay which in turn activates conventional pneumatic relay to vary output pressure in inverse proportion to current.

Maximum motor current is established by an integral set point adjustment.

(R-27 Load Limiting Relay is a product of Johnson Service Company, Milwaukee 1, Wis.)

7547 on Reader Service Slip.

Fluid flow, level meter has 15 differential ranges

Uses: For fluid flow and liquid level metering. Typical applications of meter are indicating steam, air, gas and water volume.

Features: Fifteen differential ranges from 0-20 in. to 0-400 in. of water are available for mercury-less meter. Ranges can be changed in field by simply substituting spring assemblies.

Calibrated accuracy of instrument is ± 1 per cent of full scale for ranges of 0-50 in. of water or above. For ranges below 0-50 in., accuracy is ±1¼ per cent of full scale.

Calibration is made without

the world's
SIMPLEST
sanitary meter

The only moving part in the Pottermeter-Bowser flow meter is a turbine type rotor in which a powerful magnet is imbedded. As the rotor spins with the flow of liquid an electric signal is produced. This electric impulse is directly proportional to the flow rate and is used to activate totalizers, recorders and automatic controls which can be located at the meter or hundreds of feet away.

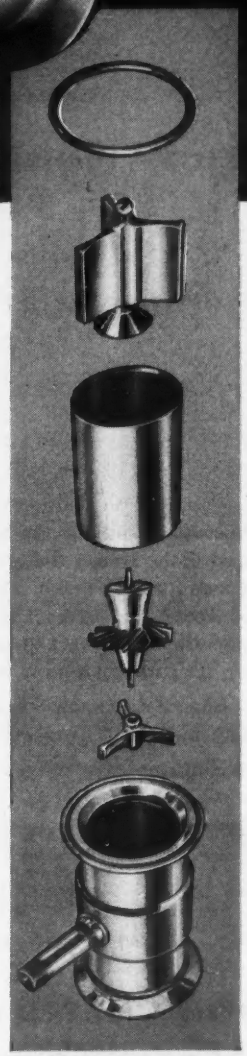
NO OTHER METER INCORPORATES ALL THESE FUNCTIONAL ADVANTAGES

- ONLY *ONE* MOVING PART
- NO THRUST BEARINGS
- 5 MINUTE DISASSEMBLY AND REASSEMBLY
- EASILY BACKWASHED
- QUICK DISCONNECT COUPLINGS
- ALL STAINLESS STEEL—TYPE 316
- AVAILABLE FOR ALL PIPE SIZES
- HIGHEST CAPACITY—LIGHTEST WEIGHT
- ACCURATE AT HIGH OR LOW FLOW RATES
- CAPACITY FROM 0.1 G. P. M. THROUGH 40,000 G. P. M.
- AVAILABLE WITH ANY ELECTRONIC RECORDING OR CONTROL EQUIPMENT

QUICK DISASSEMBLY AND ASSEMBLY FOR MAINTENANCE

Constructed entirely of stainless steel, the Pottermeter-Bowser sanitary meter can be disassembled and assembled for cleaning in a matter of minutes. Cleaning is simple and can be accomplished with standard brushes. Foolproof design assures correct assembly every time.

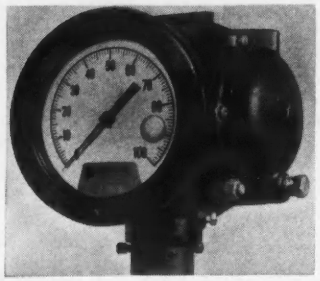
POTTER-BOWSER DIVISION



BOWSER INC.
FORT WAYNE, INDIANA

7548 on Reader Service Slip.

removing dial since micrometer zero adjustment is located on pointer.



There are two sets of high and low pressure taps on meter body. ¼-in. NPT taps are for vertical connections; ½-in. NPT taps are for horizontal connections

Instrument's hysteresis is ±¾ per cent and ambient temperature limits are from −40 F to 175 F. Compensation for ambient temperature can be made.

Description: Standard scale calibrations of instrument are 0-100 linear or 0-10 and 0-100 square root.

Indicating Bellow Meter has 6-in. indicating dial and bellows made of seamless stainless steel. Its pointer pinion is made of stainless steel and gear sector is faced with nylon.

Meter body has pressure connections for either horizontal or vertical piping. Pressure connections can be made from top or bottom with no change of parts. Because of variety of positions available for connections, installation can be made so that meter is self-venting, self draining or self-purging.

Supplier: Minneapolis-Honeywell Regulator Co., Brown Instruments Division, Wayne and Windrim Avenues, Philadelphia 44, Pa.

7550 on Reader Service Slip.

"Then it must be this other lever that sticks!"

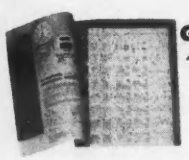
How Neptune Syrup Meter
PAID OFF TWO-TO-ONE
in first year at J. Hungerford Smith

By permitting purchases of caramel color at tank-car prices, a complete storage and metering system paid for itself twice over in materials costs alone during the first summer. And this is only part of the savings made by J. Hungerford Smith Company, manufacturer of fine root beer flavors.

Formerly, the caramel color was purchased in drums, requiring much man-handling and storage space. It took a man full time to measure the syrupy material with buckets. Now it takes only a few seconds for each batch. The operator simply sets up the Auto-Stop and opens the valve. The meter does the rest . . . shuts off automatically at the exact quantity required by the formula. The meter even turns the pump on and off.

Biggest advantage of all, according to Mr. W. Carvel Martin, plant manager: "It takes the guesswork out of the formula."

You can make savings like this in your plant.



GET THE FACTS
Ask for helpful Meter Data Bulletin 566 LFP See Neptune Data Pages in Chemical Engineering Catalog.

NEPTUNE METER COMPANY
LIQUID METER DIVISION
47-25 34th St., Long Island City 1, N. Y.

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Canada: Neptune Meters, Ltd.,
TORONTO 14, ONTARIO

7549 on Reader Service Slip.

Tank liquid level gauge accurate to 1/16th in.

Instrument has accuracy to 1/16th in. over working range of 60 ft. Its sensitivity is better than 1/64th in.; its repeatability is better than 1/32nd in.

Accuracy of gauge is result of elimination of practically all friction in system.

Instrument has two elements: force measuring mechanism, consisting of torque tube, arms and contacts, and displacer which is a solid plate. Electrical power is used to drive indicating mechanism, remote indicating transmitter and other accessory devices.

Gauge need not be adjusted for change in specific gravity. All parts which are exposed to product are made of corrosion resistant materials.

Dynamatic level gauge is described in 4-page bulletin available from The Vapor Recovery Systems Company. Operation of instrument is presented in detailed discussion and illustrations. Features of instrument are tabulated.

7551 on Reader Service Slip.

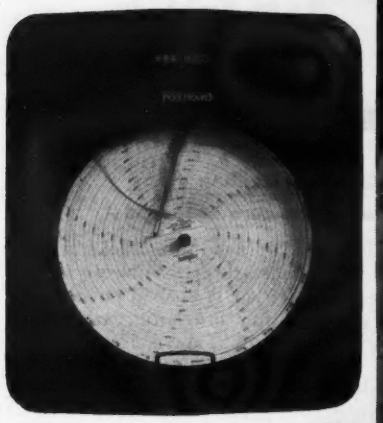
Combines features of plunger, diaphragm in metering pump

Combination piston-diaphragm pump is a positive displacement unit. However, piston does not pump fluid but only hydraulic oil. Diaphragm is moved alternately forward and backward by transmission of piston movement through hydraulic oil.

Piston operates in sized cylinder and at exact stroke length. As a result, piston displacement and therefore pumping rate is accurate.

Complete description of pump and how it operates is presented with drawings in 28-page catalog, released by Lapp Insulator Company, Inc., Process Equipment Division. Catalog discusses various functions of pump and chemicals which it can handle.

Literature also discusses, and presents illustrations of, various types of reagent heads



▲ Foxboro Dynalog electronic receiver records flow passing through Magnetic Meter — logs total in gallons per minute.

8" Foxboro Magnetic Meter ▶ measures flow of effluent into town sewage system — sends linear signal to recording instrument by electric cable.

Foxboro Magnetic Flow Meter reduces sewer tax for Pennsylvania cannery

Sewage billed on meter readings instead of water consumption

D. E. Winebrenner and Company, Hanover, Pa. had a problem. The Town of Hanover was assessing them a Sewage Tax based on the Cannery's water meter reading. In canning season, however, as much as 25% of the plant's water consumption went into the cans of peas and corn which they process.

Solution: installation of a Foxboro 8" Magnetic Flow Meter in the sewage line carrying effluent from the canning process. The town now bills on Dynalog* recorder readings, and Winebrenner pockets the savings.

The Foxboro Magnetic Flow Meter can help you cut processing costs in many other ways. Since it has no flow restrictions of any type, juices, starch slurries — even liquids as thick as molasses — can be metered accurately, continuously. There's nothing to foul or plug up. Linear measurement is made by electrodes flush-mounted in meter wall — signal carried by electric cable to a Dynalog receiver-recorder. Meter and receiver seldom — if ever — require maintenance.

Ask your Foxboro Field Engineer to show you how the Magnetic Flow Meter can save you money and increase the efficiency of your plant. Or write for Bulletin 20-14. The Foxboro Company, 926 Neponset Avenue, Foxboro, Massachusetts.

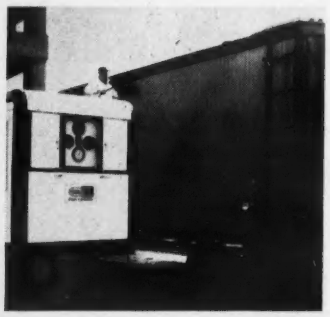
*Reg. U. S. Pat. Off.

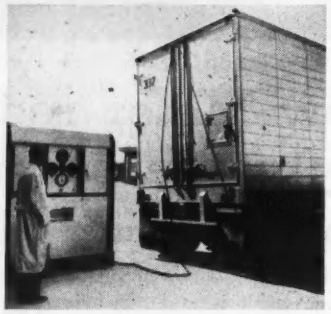
FOXBORO
REG. U.S. PAT. OFF.

7552 on Reader Service Slip.

Attain zero WITH PURECO CO_2 "BLAST CHILLING"

Maintain zero WITH PURECO "DRY-ICE"





Pureco CO_2 Blast Chilling drops temperatures to sub-zero in seconds!

Pureco Carbon Dioxide liquid sprayed into trucks or railroad cars reduces interior temperatures to sub-zero in seconds. The warm moisture-laden air is flushed out and replaced with cold, dry vapor, thus preventing any "heat shock" from loading temperatures. Time-consuming precooling periods are shortened—after loading pull-down periods are eliminated—product temperatures remain constant. Result . . . savings in fuel and maintenance.

Pureco CO_2 *Blast Chilling* needs no special equipment . . . it works with what you now have . . . mechanical units, hold-over systems or "DRY-ICE".

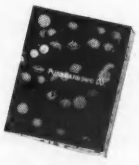
Pureco "DRY-ICE" holds zero temperatures.

Pureco "DRY-ICE" is the coldest (—109°F) solid refrigerant commercially available. It is simple to use, easy to handle, does not melt but passes directly to a gas. The degree of cooling of "DRY-ICE" can be thermostatically controlled by blowers or other simple means.

Have a trial Blast Chilling demonstration.

Pureco would like to demonstrate the specific uses of Pureco CO_2 *Blast Chilling* and "DRY-ICE" to you in *your plant* under *your working conditions* . . . with no obligation on your part. Call your local Pureco representative for details or write:

New Pureco booklet "How Carbon Dioxide Serves You". Write for free copy.



PURECO CO_2

PURE CARBONIC

Pure Carbonic Company, A Division of Air Reduction Company, Incorporated
Nation-Wide Pureco CO_2 Service-Distributing Stations in Principal Cities
General Offices: 150 East 42nd Street, New York 17, N.Y.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

7553 on Reader Service Slip.

available for effective metering of difficult fluids. There is a special section devoted to auto-pneumatic and electronic controls. Tables showing capacities, sizes and specifications of various types of Pulsafeeders are included.

7554 on Reader Service Slip.

Connect thermocouples quickly, easily

Plug and jack assemblies can be used to connect thermocouples to extension wire, and thermocouple extension wire to instrument.

Bodies of plug and jack are made of glass-filled alkyd plastic and have ambient temperature rating of 350 F. Their sides are ribbed for easy gripping. Jacks have collect-type inserts with different-diameter positive and negative poles to insure correct polarity.

List of various components and description of each is contained in specification sheet FS005-3, issued by Minneapolis-Honeywell Regulator Co., Industrial Division.

7555 on Reader Service Slip.

Measures liquid flow or liquid level

Flowmeter is accurate to within ½ of 1%

Features: Meter, utilizing pressure differential acting on bellows, is accurate to within 0.5 per cent of full scale. Its sensitivity is 0.05 per cent of full scale.

Instrument has five operating ranges from 0-20 to 0-300 in. of water.

Indicating and/or recording meter can be equipped with controller, totalizer, or pneumatic or electric transmitter.

Description: Metallic bellows flowmeter has one-piece bellows made of stainless steel. Meter body is self-draining and self-venting and is made in aluminum, forged steel or forged stainless steel.

Supplier: Fischer & Porter Co., 471 Jackson Road, Warminster, Pa.

7556 on Reader Service Slip.

How to solve the problems of setting up a control lab

Basic plan, followed by a medium-size candy plant, outlines lab requirements as well as the kind of results which can be achieved

GEORGE H. THOMPSON
Vice President
Vernell-Thompson Candy Co.

George H. Thompson, well-known figure in West Coast candy circles, assumed presidency of Thompson's Candy Co. in 1948. The Seattle firm, started by Mr. Thompson's father in 1917, formally merged with Vernell's Buttermints, Inc., also of Seattle, on July 1, 1958. The firm is now owned by Van de Kamp's Holland Dutch Bakers. The Vernell plant has been enlarged by a 43,000 sq ft addition, and all manufacturing is consolidated there.

HAVING expanded from a small to a medium-size candy company, now employing 50 to 60 persons, we have experienced many growth pains. Among these was a lack of production control.

As sales expanded, production and quality control problems occupied an increasing amount of management time — time that was needed more and more for business and sales strategy purposes.

We realized an improved approach to control over production was needed to benefit our operation.

Such an approach was embodied in a proposal to candy manufacturers supplying confections to Sears Roebuck & Company. Sears had outlined a basic plan for these manufacturers which we considered a good beginning toward the establishment of a laboratory fitting in well with our size organization.

The plan suggested the necessary furniture, chemicals, apparatus and equipment — only standard types — all available at moderate cost.

Following Sears' basic plan, using most of the equipment recommended, we were able to set up our quality control lab for around $6000, including construction work, cabinets, sinks and installation. (See lab photo.)

Science reinforces artisans

We think that our candy makers were the typical proud artisans of their trade before the inception of laboratory control, and they still are. When H. Kenneth Grant, our chemist, first came upon the scene, they seemed to assume the attitude that he was somehow going to reduce their prerogatives as skilled workmen.

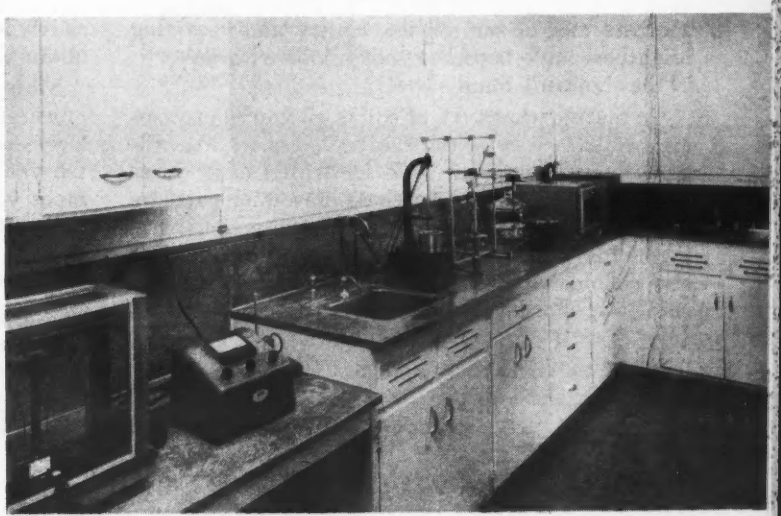
There was the chance, also present, that this newcomer might have some speed-up duties as well as quality control.

Our chemist's first efforts were in the area of determining exactly what we were doing in production and to make records of existing procedures as a starting point.

He was amazed at some of the uncontrolled difficulties which the production people had come to accept as standard — "something to be lived with" — to the point that many inefficiencies and wasteful methods were not even reported to management.

This was resulting in excess wasted materials, excess scrap and other unnecessary expenses.

By a simple but scientific narrowing down of these difficulties, our chemist was able to throw light on these prob-



Area for quality control lab was taken from general office space. Equipment, among that listed in quality control specifications from Sears Roebuck & Co., and partly shown above, includes cabinets, sinks, vacuum oven, analytical balance, controlled temperature water bath, pH meter, viscosimeter, hood with exhaust blower, chemical reagents and glassware

lems and get them, in some measure, corrected.

This resulted in breaking the ice and reasonable acceptance by the candy makers. A gradual change in attitude ensued as improvements in procedure resulted, and control of techniques moved from individual decision to the lab.

Improvements from lab

One of the most important improvements from our program is the difference in the attitude of our people.

The attitude, presently extant in our plant, is one of willing cooperation with the chemist, and distinctly improved routine to do each step of the manufacturing job according to objective, scientific standards.

The savings in reduced scrap and improvement in sales of our better products are reason enough for the existence of the lab.

Management is left with time to devote to new products, sales problems and other effective projects as a result of the efforts of the lab department.

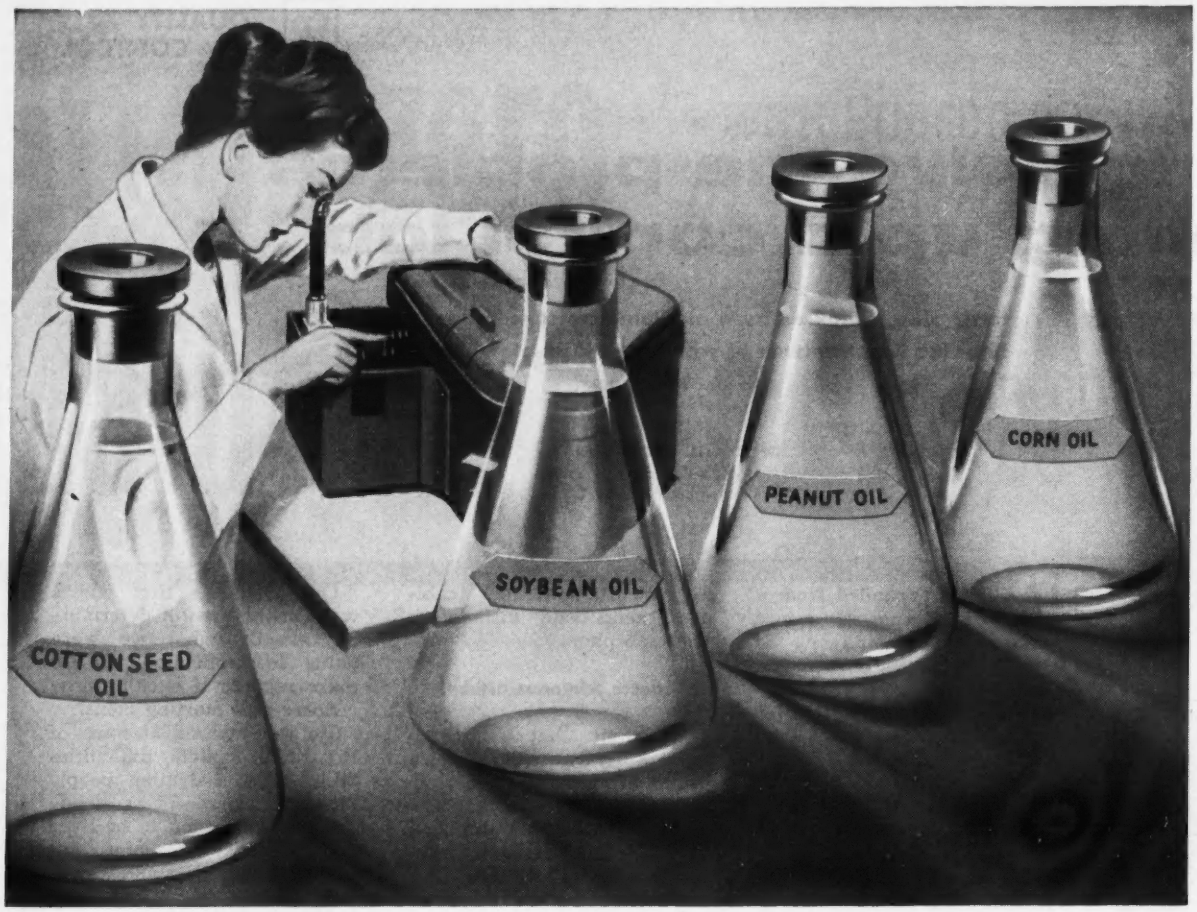
Customer complaints — and who doesn't have them — as well as returned goods, have been greatly reduced by this program.

Another advantage, — always hard to pin-point, but very realistic — is that the laboratory gives desirable organizational form to production, in that information flows directly from management to plant and back through the chemist, who is recognized as a part of each.

What QC chemist does

Here's a practical example of how the lab, under the direction of H. Kenneth Grant, has relieved management of former headaches. Previously, we were never able to avoid the occasional run of spice drops that were too hard, or gum drops that were not firm enough to withstand jumble packing in bulk.

Now, however, a quick method has been worked out to determine when the jellies



The more you can see through 'em—the faster you'll sell 'em

Filter edible oils with Celite filter aids

In this era of self-service, clarity and sparkling brightness have become synonymous with flavor—in the shopper's mind's eye!

No matter what type of edible oil you're processing, you'll be sure of the clarity and sparkling brilliance your customers look for with Celite* filter aids. Every cubic inch of these diatomite particles presents over 5,000,000 microscopic "filters" to passing fluids . . . removes the most minute solids and colloidal matter which could otherwise affect clarity or shorten shelf life. And for any degree of clarity desired, Celite gives the fastest flow rates obtainable.

Many food technologists have found that the quickest and easiest way to solve a filtration problem is to call a nearby Celite field engineer. He can tell you which of the many Celite grades will best meet your needs. Why not call today for a no-obligation analysis of your filtration operations? Or write to Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

7557 on Reader Service Slip.

have cured enough so that they can be taken from the starch molds at just the right time.

Another one of management's regular worries that has been reduced is the problem of plant sanitation.

Fundamental responsibility still resides in management. However, our chemist handles clean-up supervision, and has worked out proper schedules and simple reports to be used by our clean-up people daily.

He issues regular instructions and calls attention to any deficiencies in the clean-up procedures.

Introduced in 1947, and first nationally advertised in 1951, Vernell's Buttermints are sold nationwide throughout the year

Many other routine techniques have been brought under laboratory control, with definite benefits resulting from the changes.

Naturally, the chemist does not participate in production scheduling. But he is aware of these plans as they relate to his preparation of colors and flavors.

As he takes batch size bottles into the plant, picks up his control reports and examines the finished candies as they are being packed, he very well provides the quality control function we need.

END

HELP YOURSELF . . . .

For a quick reference to new technical literature available this month, see the classified listing on page 115.

AIRCO GASES

(NITROGEN — CARBON DIOXIDE — ARGON — NITROUS OXIDE)

keep foods tasty - lengthen shelf life

If your food product is frozen or fresh, dried or powdered, it will taste better, look better, last longer and *sell easier* if it is packed with an Airco inert gas.

Products such as sliced cheese, luncheon meats, nuts, instant potatoes, soup mixes, powdered milk, fresh or frozen fruits and vegetables, packed in flexible film, benefit greatly if they are "blanketed" with an inert gas or mixtures of such gases.

Vacuum and inert gas blanketing prevents oxidative discoloration and quality loss — preserves inherent good flavor and color — and most important, lengthens product shelf life. In new flexible-packed frozen foods, Airco gases help prevent deterioration and costly "freezer burn."

And for products packaged under pressure, Airco propellants provide the proper push at lowest cost.

See an Airco technical representative soon for the gas best suited for your use. As a start, why not send for the free informative brochures listed in the coupon below — they're yours for the asking, without obligation.

At the Frontiers of Progress You'll Find An Air Reduction Product

AIR REDUCTION COMPANY, Inc.

CUSTOMER SERVICE PACKAGING LABORATORY

1400 East Washington Avenue
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AIRCO

AIR REDUCTION COMPANY, INCORPORATED
CUSTOMER SERVICE PACKAGING LABORATORY Dept. FP-6
1400 East Washington Avenue, Madison 10, Wisconsin

Please send, without obligation, the material requested below:

- ☐ "NEW OPPORTUNITIES FOR MORE PROFITABLE PACKAGING"
- ☐ "FACTS ON GASES USED FOR FOOD PRODUCTS"
- ☐ "TECHNICAL INFORMATION — Gas Propellants for Pressurized Packaging of Foods and Other Products"
- ☐ "NITROUS OXIDE AND 'FREON C318' - as propellants for aerosol food products"

Name.....

Title.....

Company.....

Address.....

City.....Zone.....State.....

7558 on Reader Service Slip.

MOS

NEW SYSTEMS TECHNIQUE PROVIDES CURRENT DATA TO CONTROL YOUR MANUFACTURING CYCLE... MAKES YOUR OPERATION MORE EFFICIENT, WITH FASTER RESPONSE TO CHANGES

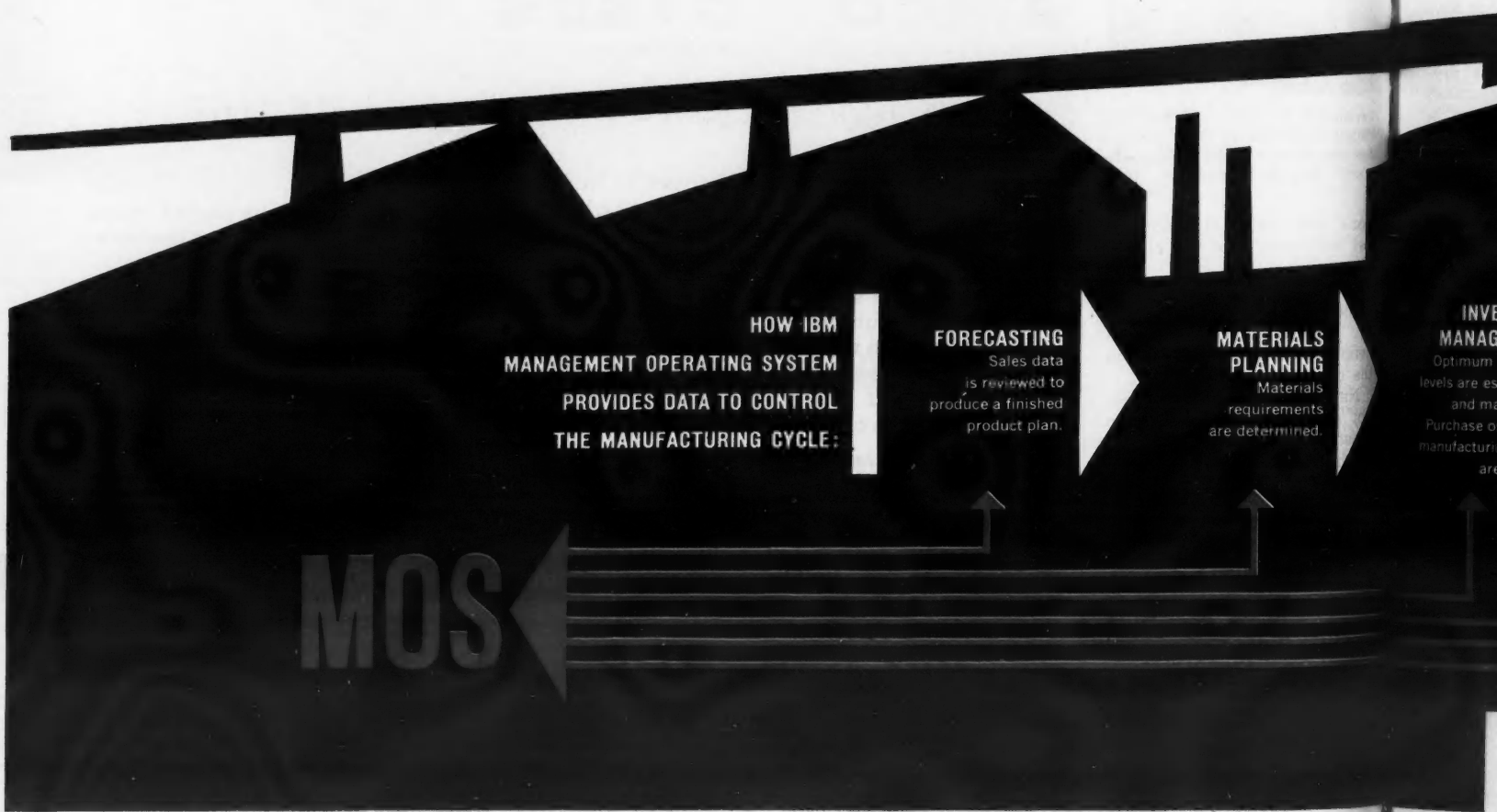
IBM MANAGEMENT OPERATING SYSTEM

To coordinate planning and control functions continuously throughout the manufacturing cycle IBM has developed a unique Management Operating System. This system makes use of existing IBM data processing equipment, proved in thousands of industrial installations.

WHAT IS THE IBM MANAGEMENT OPERATING SYSTEM?
MOS is a data processing technique that provides the information needed to control your manufacturing cycle. It is designed to handle automatically the decision data required to carry out related functions, from planning and operations control to evaluation. It provides accurate data on a continuing basis . . . in time for effective management decisions.

WHO CAN USE MOS?
The IBM Management Operating System is a flexible technique that can be applied to most types of industrial operations. Every manufacturing operation is unique, however, and IBM manufacturing representatives have been trained to work with you to adapt the basic concepts to your needs. This is an important aspect of IBM Balanced Data Processing—compatible equipment backed by complete services. It gives you comprehensive support in applying the system to your company's operation.

For full information about the IBM Management Operating System, contact your local IBM office.



INVENTORY MANAGEMENT
Optimum inventory levels are established and maintained. Purchase orders and manufacturing orders are created.
SCHEDULING
Based on customer requirements and available facilities, a manufacturing plan is produced.
DISPATCHING
Work priorities are established to implement the manufacturing plan. Adjustments are made to meet engineering and shop changes.
EVALUATION
Operating data is compared to control standards. Exception reports, on cost and efficiency, are furnished for timely management action.

IBM®

BALANCED DATA PROCESSING

7559 on Reader Service Slip.

Planning ahead can save $20,000 on fluid mixing

An idea from your LIGHTNIN Mixer representative's briefcase

This engineer is listening to an idea that's going to save his company $20,000 on fluid mixing.

He's working on a process that will employ mechanical mixers. But in a year or so, process requirements are expected to change, throwing 15% greater load on the mixers.

Problem: how can he anticipate this change *now?*

Solution proposed by LIGHTNIN Mixer representative: install standard turbine-type LIGHTNIN Mixers geared for the immediate job, but sized to handle the expected load.

When requirements increase, simply change impellers and two gears in each mixer—providing correct power input for the new conditions at minimum expense.

What this man can do for you

This is one example of the many ways your LIGHTNIN representative can help you get efficient fluid mixing at lowest long-term cost.

He can give you better service on fluid mixing than anyone else—because he has seen and done more of it.

Take advantage of his unmatched experience by putting him on your process-design team. For prompt help on any fluid mixing operation, call him in now. He's listed in Chemical Engineering Catalog. Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 132-f Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

7560 on Reader Service Slip.

Combines liquid-to-solids blending with vacuum drying

Concurrent operations:

- **increase flexibility, control**
- **reduce processing steps, material handling**

COMBINATION blender-vacuum tumble dryer can be used for wide variety of materials to pre-blend under various conditions, introduce and disperse any flowable or pumpable fluid and then dry.

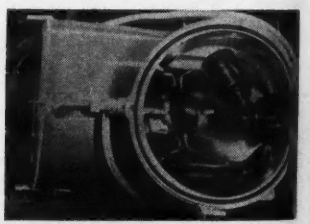
Operations of blending, liquid dispersion and drying may proceed under atmospheric conditions, vacuum or inert gas. Drying may be by heated jacket or by direct hot-gas drying.

Dispersion of liquids and quantity dispersed is closely controlled to produce fine or coarse granulation. Dispersion and overall motion of machine produce uniform blending of even small amounts of liquid in dry material.

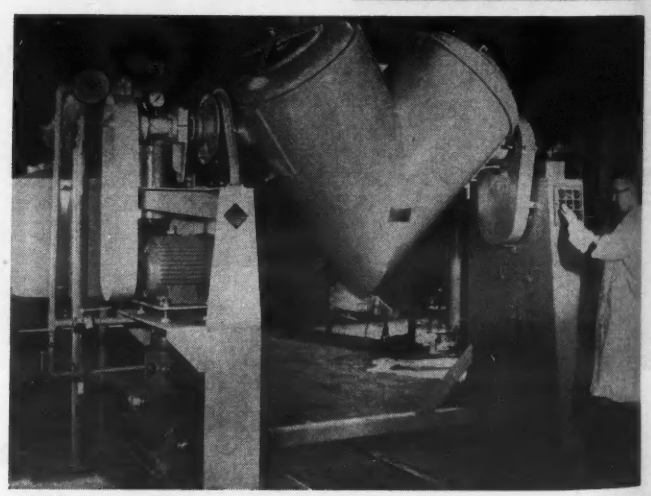
Push-button operation changes cycle from blending to drying. Rapid drying cycle is closely controlled through regulation of three variables: vacuum, heat and tumbling action.

To break up balls that have formed during drying of fine particle-size materials and thus facilitate complete drying to fine powder, separately actuated agitator bar can be switched on.

Unit basically consists of two cylindrical shells assembled into a V-shape. Heating jacket envelops both shells,



Dry ingredients are charged into combination unit from either of two openings at top. Discharge is through flow-control valve at apex. Dispersion disc, left in open tumbler, uniformly distributed liquids. Vapor take-off connection is to right



and water circulating through jacket is automatically controlled up to temperature of 200 F.

Mounted across axis of unit is hollow dispersion bar through which fluids or gases flow. Spinning cylindrical bar is equipped with machined dispersion disc to provide uniform distribution of liquids into pre-blended solids.

Combination unit is further equipped with filter, condensers, receivers, vacuum pump and instrumentation.

Liquid dispersion bar can be conveniently removed from "snap-in" lock position, cleaned and replaced; whole unit can be quickly and easily cleaned by simple hosing.

Completely packaged systems are available in standardized models with charge capacity ranging from 1 to 50 cubic feet.

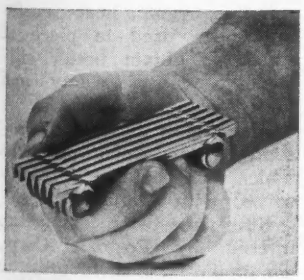
(Solids Processor is a development of The Patterson-Kelley Co., Inc., Stroudsburg, Pennsylvania.)

7561 on Reader Service Slip.

Up screening, dewatering capacity with wedge-wire screens

Uses: For screening, sifting, dewatering, sizing and washing in canning, sugar refining and other food processing operations.

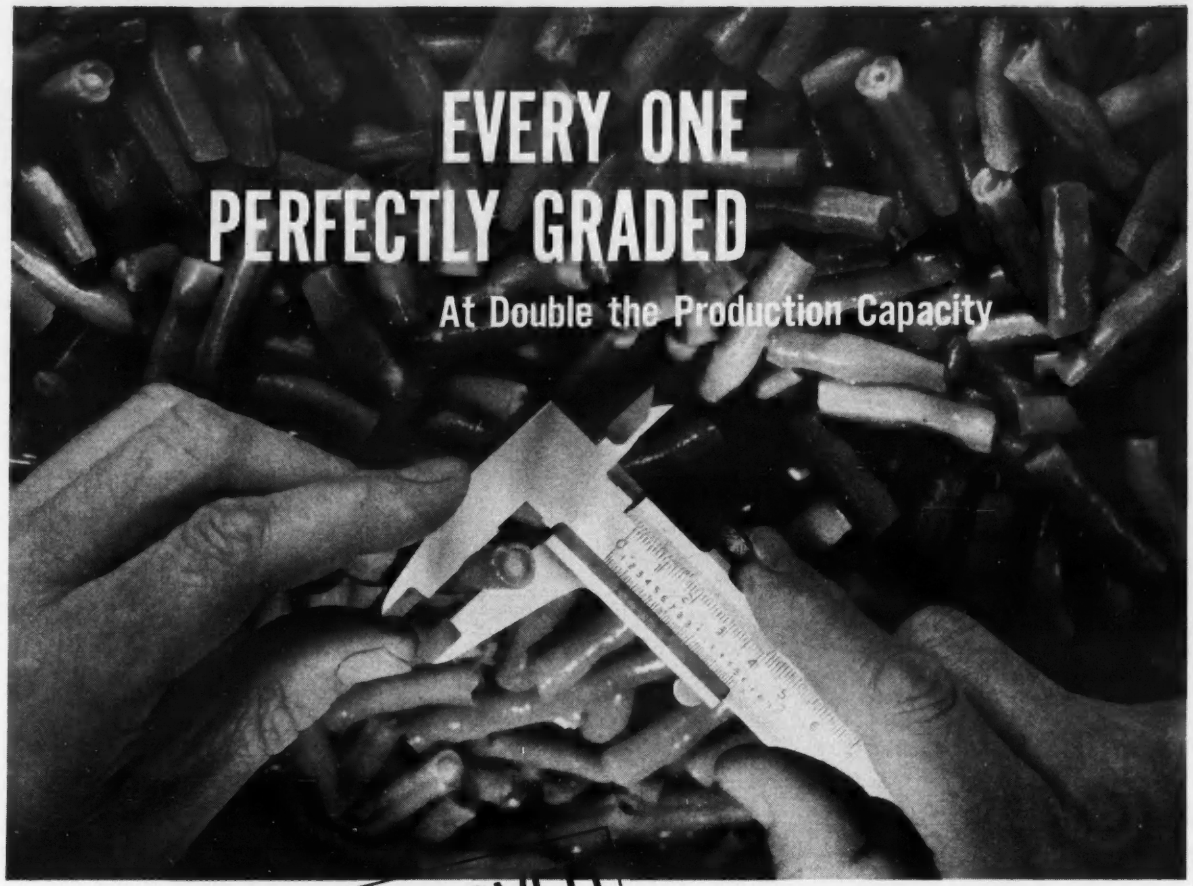
Features: Wedge wires have high, narrow profile. Consequently, more wires per area



Slits of wedge-wire screens can be as narrow as 0.002 in.

of working-screen surface are possible, or percentage of open area on screen is increased thus increasing capacity.

Description: Screen wires



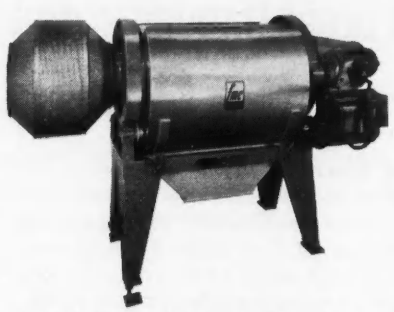
fmc IMPROVED BAR-TYPE GRADER

- GREEN OR WAX BEANS, WHOLE OR CUT
- STRIP-CUT POTATOES, PLAIN OR CRINKLE
- DICED OR SLICED CLINGSTONE PEACHES
- SIMILAR DICED OR SLICED PRODUCTS

Based on practical field experience, and operation of several hundred units during the past three seasons, FMC now offers an improved model of its highly efficient Bar-Type Grader. Employing the original FMC principle that actually doubles production capacity of conventional types, the improved machine now incorporates these new features:

- Increased area between side guards and grading drum provides for free fall of product, prevents hangup.
- Increased capacity with no increase in floor space.
- Positive ring gear drive prevents slipping, even under full load.
- Single cam action provides smoother operation, less wear.
- Duthane trunnions are used, for increased machine life and super-quiet operation.

And there are many more. Get all the facts on this efficient grader today. Write for information, or call your FMC representative.



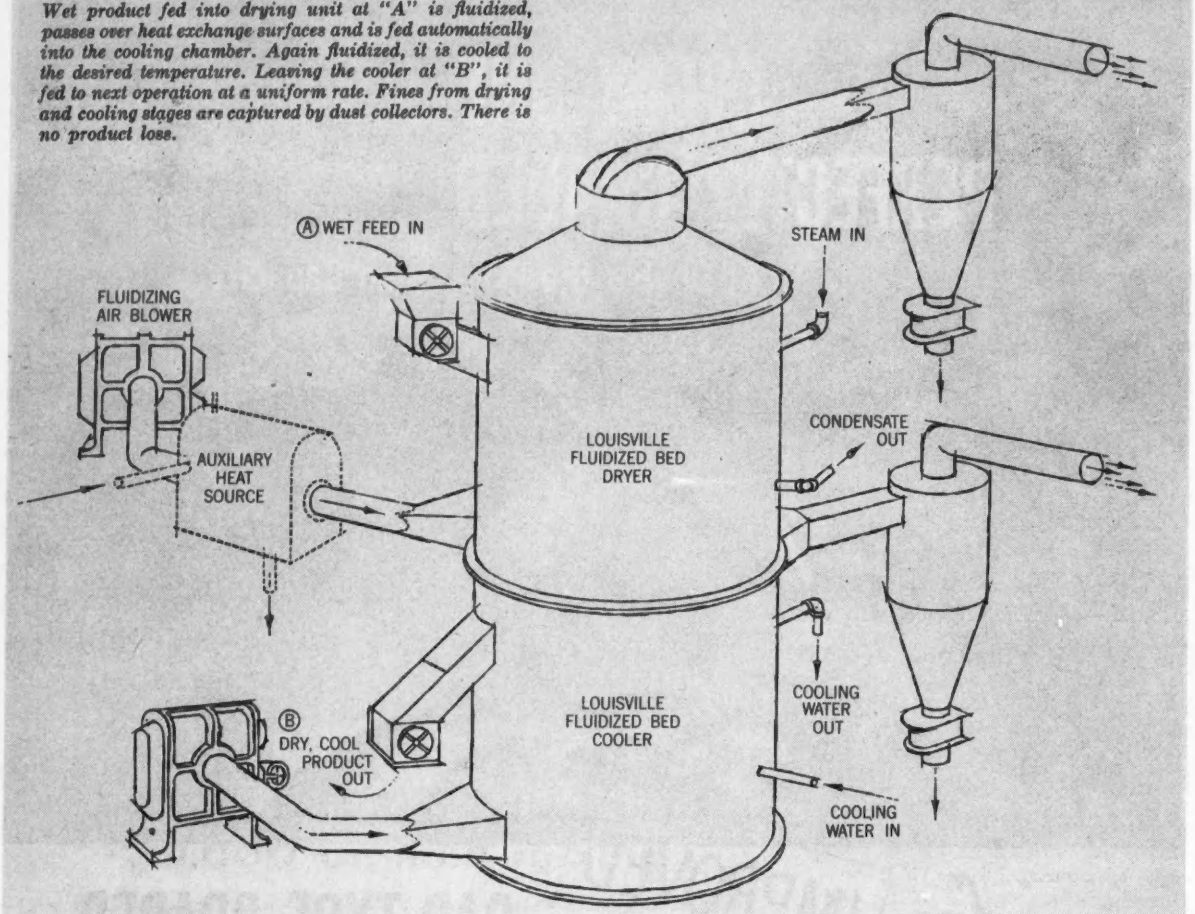
The improved FMC Horizontal Bar-Type Grader is available in single grader for two separations, or double grader with three, for size-grading by diameter and in accordance with U.S. Standards. Capacities up to 3400 lbs. per hr. on whole green beans; up to 4200 lbs. on cut beans.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

7562 on Reader Service Slip.

Wet product fed into drying unit at "A" is fluidized, passes over heat exchange surfaces and is fed automatically into the cooling chamber. Again fluidized, it is cooled to the desired temperature. Leaving the cooler at "B", it is fed to next operation at a uniform rate. Fines from drying and cooling stages are captured by dust collectors. There is no product loss.



Major break-through in drying and cooling techniques announced by

GENERAL AMERICAN

A new system for drying and cooling has been perfected by General American Transportation Corporation through their development of Louisville Fluidized Bed* equipment. Two Louisville units, one functioning as a dryer and one as a cooler are coupled vertically to provide a continuous automatic operation.

The system is particularly useful for crystalline chemicals, resins, polyvinyl acetate beads, polyethylene pellets, sugar and similar products having the proper particle size distribution.

Louisville Fluidized Bed equipment offers these advantages:

1. Accurate, instantaneous temperature control
2. High heat transfer that permits compact design
3. Low maintenance costs (no moving parts)
4. Less cleaning time and labor
5. Less floor space (equipment is vertical)
6. No hot spots (product is fully protected)

Because of their simplicity, Louisville Fluidized Bed dryers and coolers adapt readily to complete automation.

For full details about this revolutionary development in drying techniques, write Dept. B.

Process Equipment Division
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South LaSalle Street
Chicago 3, Illinois
Offices in principal cities

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

*Patents Pending

7563 on Reader Service Slip.

are made in several profiles and have spacing lugs to provide rigidity, prevent lateral deflection and maintain slit spacing.

Rema® wedge-wire screens are made of stainless or carbon steel and are furnished in various standard shapes. Special shapes are also available.

Supplier: National-Standard Company, Cross Perforated Metals Plant, Carbondale, Pa.

7564 on Reader Service Slip.

Pressure feeder increases screw press capacity

How pressure feeding into screw press increases press capacity is subject of 2-page bulletin P-33, available from The Bauer Bros. Co.

Photos and diagrams aid in describing the No. 564 Pressure Feeder, used to load bulky material of low density or extremely wet materials into continuous screw press under pressure.

Unit may also be used separately for various low pressure washing and thickening operations involving fibrous materials. Bulletin includes data on typical applications, operation of the unit and its advantages in force feeding.

7565 on Reader Service Slip.

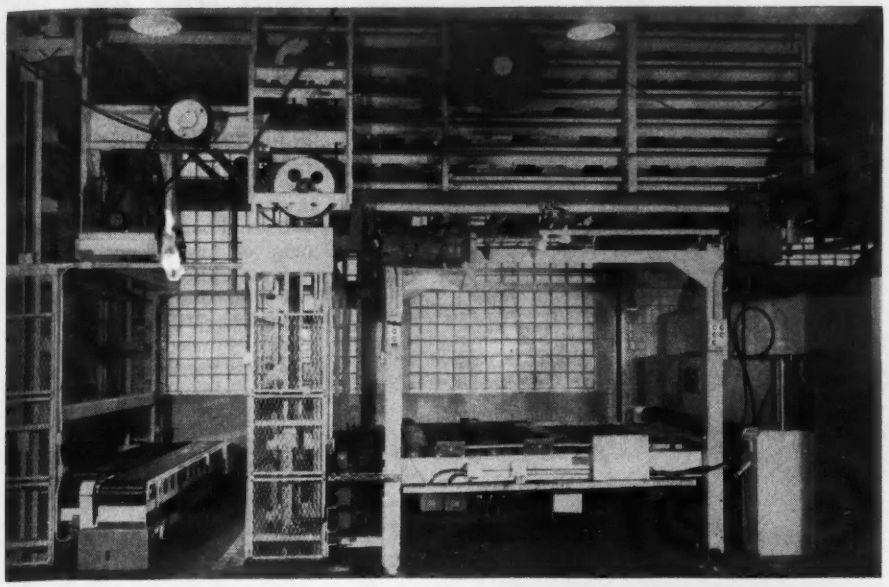
Leakproof pumping of heat-transfer fluids

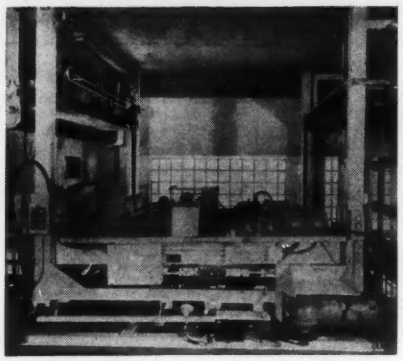
Stable, organic heat-transfer fluids are used in place of steam to obtain better efficiency, control, safety and lower maintenance costs.

Pumping of these fluids presents its own special problems which can be more readily solved with canned pumps.

Nine-page technical bulletin, offered by Fostoria Corp., Chempump Division, presents a discussion of three organic heat-transfer fluids and methods of pumping them. Typical systems, special operating points and methods of avoiding start-up problems are discussed.

7566 on Reader Service Slip.





Unloader-transfer unit moves pies from discharge end of 70 by 9 ft tunnel oven right, to loading end of overhead pie cooler, left center. Discharge leg of cooler is at far left, going down to unloading station on mezzanine floor. When oven is unloaded manually, transfer unit is raised, photo at right

Unloader-transfer unit moves out of way for manual unloading

Mechanically transferring baked goods from discharge end of tunnel oven to loading leg of traveling-tray cooler is a relatively simple matter. Complications arise, however, when area in front of discharge end of oven must also be free for unloading baked goods manually.

Solution to problem is unloader-transfer unit which automatically unloads products from oven and transfers them to cooler.

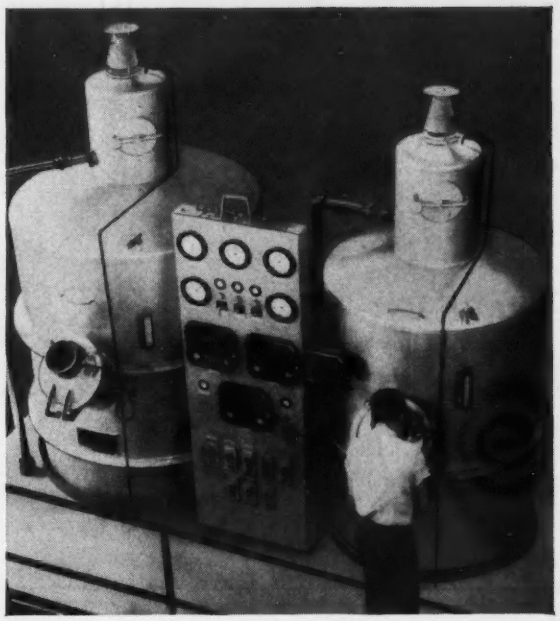
For products which must be immediately depanned, such as carmelized foods, units are raised to clear area for manual unloading.

Installation of unloader-transfer unit is part of long-range modernization program of Horn & Hardart. Firm, which operates 101 retail stores and Automats in New York City, recently completed installing three ovens, five coolers and five unloader-transfer units.

Four of the unloader-transfer units are on production lines for cakes and sweet goods; fifth unit is installed on line used exclusively for pie production, see photos above. Additional photos of this operation are given in eight-page bulletin published by supplier, Baker Perkins, Inc.

7567 on Reader Service Slip.

BUFLOVAK



Evaporators
for food products

tomato pulp, oyster broth,
fruit juice, glucose, gelatin

Whatever your material in process may be, Buflovak Equipment will provide the way to the most profitable operation. The right evaporator, selected from a complete range of designs, can be job-tailored for your product. The Buflovak evaporator line includes: Natural and Forced Circulation, Downflow, Agitated Film Roto-Vak, Crystallizers, Calandrias, Single and Multiple Effects. For details, write for Catalog 372, Buflovak Equipment Division, 1559 Fillmore Avenue, Buffalo 11, New York.

Buflovak Equipment Division
BLAW-KNOX

7568 on Reader Service Slip.

Nothing... but nothing... stops a Rex distributor

The motto for the U.S. Postal Service is just the beginning for a Rex Distributor. Severe climatic conditions... impossible delivery requirements... unusual product application assistance... nothing stops these couriers from the successful completion of their self-appointed responsibility: providing the best in customer service.

Oh, incidentally, they handle only the best: Rex TableTop, PlateTop, CrescentTop, Case Conveyor, Roller and Chabelco Chains and Sprockets. Need his name? Write CHAIN Belt Company, 4699 W. Greenfield Ave., Milwaukee 1, Wis. CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

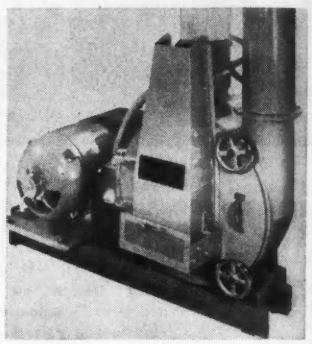
REX®
CHAIN BELT COMPANY

7569 on Reader Service Slip.

Mill cuts hp, ups production

Pulverizer readily handles low melting point products

Uses: For pulverizing products of crystalline, granular or amorphous structure in small, medium or large particle size. Mill has been successfully used on such food products as flour, corn, soya flakes, sugar, barley, dried milk, bread crumbs, starches, peanuts and meat scraps.



Originally developed in Germany, unit is essentially a combination impact and grinding mill

Features: Mill has high production capacity, yet low power requirements. For example, one food processor finds that when pulverizing barley, he now needs only a 30-hp motor where he formerly required a 80-hp motor. Further, production has been increased by 5 per cent.

Mill also grinds with very low temperature rise. Test made on sugar grinding operation showed a temperature rise of only four degrees (from 67F to 71F) after 45 minutes of operation.

Description: Noll Pulverizer is made in two sizes: 20-30 hp and 40-50 hp. Machine consists of five major components which are as follows: feeder, air separator, rotor, screens and liner.

Feeder has transparent plastic cylinder for visual inspection and rotor operating at 100 rpm. Rate of feed can

be quickly adjusted by lever.

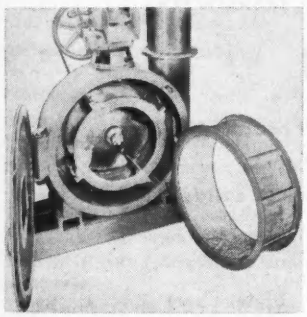
From feeder, product is discharged through air trap into rotor. Trap removes any foreign particles.

Rotor is made with 4, 8 or 16 blades depending upon material to be processed. End of rotor blades are protected by abrasive-resistant steel plates. Screens are furnished in variety of sizes to meet different requirements.

Liner is foremost part of pulverizer. It is constructed for processing specific products and is surfaced with ¾-in. thick emery stone segments.

Operation: Materials enter pulverizer and are caught up by high speed rotor which accelerates the particles up to peripheral speeds of 18,000 fpm. Rotor smashes particles against, and throws them over abrasive liner. Action continues until required fineness is obtained and particles can pass through screen of desired mesh.

Typical operating results are as follows: beet sugar through 1/32-in. screen—3400 lb/hr with 20-hp motor,



Liner, right, is easily removable and can be changed in a few minutes. Approximately 20 per cent of its cylindrical area is made up of screens

6500 lb/hr with 50-hp motor; harmony meal through 1/32-in. screen — 3500 lb/hr with 20-hp, 7000 lb/hr with 50-hp; extracted soya flakes through 1/16-in. screen — 2900 lb/hr with 20-hp, 4800 lb/hr with 50-hp.

Supplier of pulverizer, Noll Machine Corp., 1977 E. 73rd St., Chicago 49, Ill., offers laboratory facilities for testing products on pulverizer.

7570 on Reader Service Slip.

VOTATOR rotary piston fillers offer specific advantages, such as greater rigidity with *four point* suspension—thus greater accuracy, self-cleaning valve seats, fine micrometer adjustment *even while in operation*, and easy accessibility of valve guides, ports and rollers. Large diameter Nylon piston and valve rollers reduce wear. In addition, VOTATOR piston fillers feature high-speed no-container, no-fill mechanism, a fully enclosed gear case, adjustable legs, and a wide variety of valve sizes.

VOTATOR gravity fillers are designed for filling liquids having free flowing characteristics. Special seal pads at the base of the valve assembly make a tight seal possible even if top flange of container is not perfect. Extra large valves reduce foaming and increase accuracy. Extra long valve sleeves provide smoother operation, reduce leakage and prevent sticking. Changes for different size containers are quick and easy. Adjustable legs, fully enclosed gear case, a variety of valve sizes and Nylon lifter rollers are more features of VOTATOR gravity fillers.

ROTARY PISTON FILLERS

Model No.*	P6L	P9L	P12L	P18	P18L	P27	P27L	P36	P36L	P6G	P9G
Max. Capacity of Fill (oz.)	40	40	40	20	40	20	40	20	40	160	160
Max. Container Dia.	404	404	404	303	404	303	404	303	404	610	610

GRAVITY FILLERS

Model No.*	G6L	G9L	G12L	G18	G18L	G27	G27L	G36	G36L	G6G	G9G
Max. Capacity of Fill (oz.)	48	48	48	32	48	32	48	32	48	128	128
Max. Container Dia.	404	404	404	303	404	303	404	303	404	603	603

*Model denotes number of stations

Let us show you which is best for you

VOTATOR Fillers are designed to provide accuracy and speed throughout all practical production ranges and container sizes.

In both the piston and gravity types, ranging from 6 through 36 stations, smoothness of operation, ease of integration with associated equipment, rugged, trouble-free construction, and expert know-how and service on each individual installation assure top packaging performance and economy.

Write or call for additional specific information. Bulletins describing both piston and gravity fillers are available upon request. There is no obligation.

®T. M. Reg. U. S. Pat. Off.

GIRDLER PROCESS EQUIPMENT DIVISION
CHEMETRON CORPORATION
Louisville 1, Kentucky
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Sales Offices: Louisville • New York
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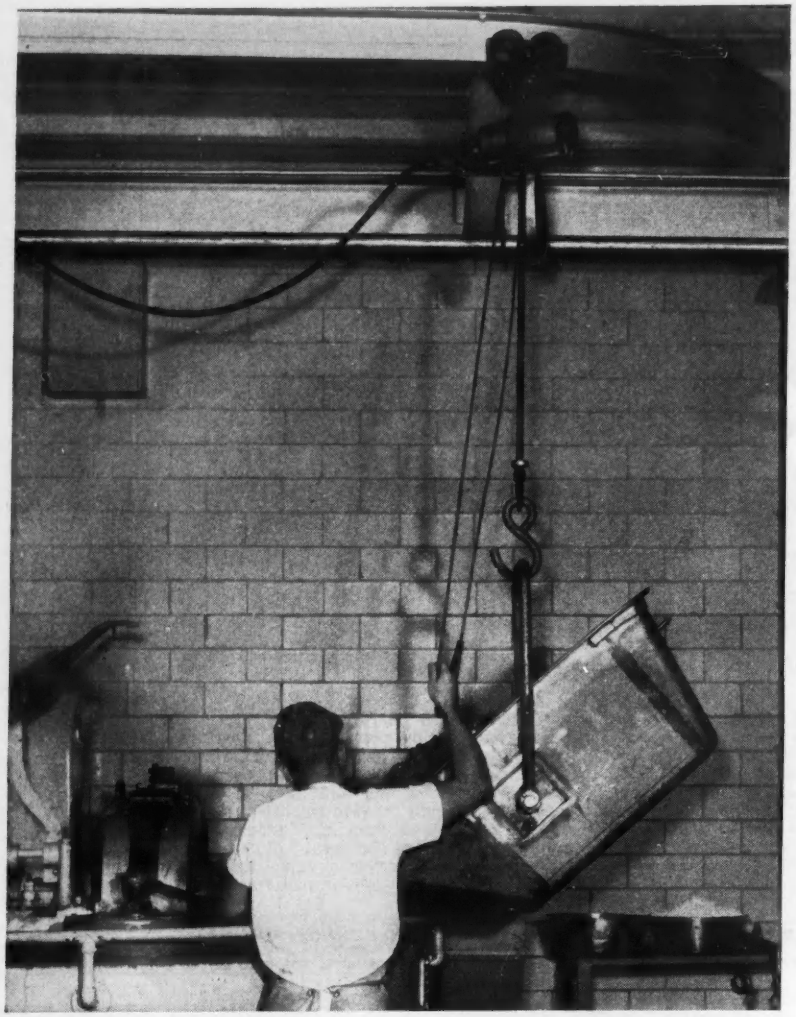
VOTATOR CONTINUOUS PROCESSING EQUIPMENT FOR CHEMICAL & FOOD INDUSTRIES • VOTATOR PISTON & GRAVITY FILLERS • VOTATOR PLANTS FOR FATTY OILS INDUSTRY • THERMEX DIELECTRIC HEATING-EQUIPMENT

7571 on Reader Service Slip.



"Work-horse" hoists
speed food processing

Charging a 500-lb.-capacity cutter and mincer, this man easily and quickly spots heavy stainless steel bucket in position—*in a matter of seconds*. He controls load with one hand while Gardner-Denver air hoist does *all* the work. He's using the "work-horse" hoist of the line—powered by a piston-air motor. But this is just one of the complete line of Gardner-Denver air hoists (from 150-lb. to 2-ton capacity). And where speed is of primary importance in your lifting jobs, check the new rotary motor air hoist—the "race horse" of our line. Whichever type you choose, you always get the swift, safe lift you need.

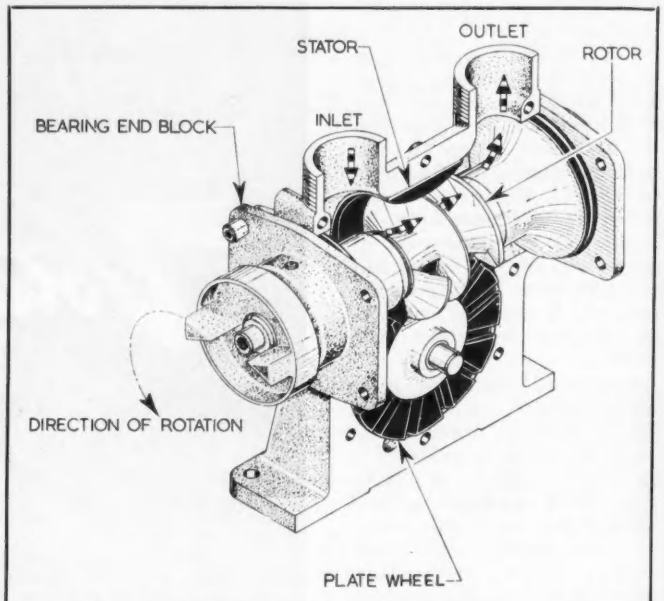
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER Since 1859

GARDNER DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

7572 on Reader Service Slip.



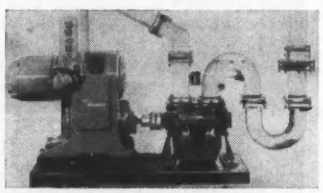
Positive displacement pump is adapted from 2000 year old screw principle. Plate-wheel assures tight sealing action

Pulseless pumping without foaming, oxidizing

Positive displacement unit readily handles

- **air entrainement**
- **suspended crystals or solids**

PUMP utilizes Archimidean screw principle in that it has helix or screw rotating in a cylinder. Consequently it will not damage suspended crystalline matter. In addition, there is a serrated plate-wheel mounted below steel screw, see drawing above.



Unit shown is being used to pump 200 gpm of water with solids through 15-ft loop of 3-in. glass pipe

Plate-wheel has elastomer surface. When rotating, it has wiping action on screw that is similar to squeegee action of windshield wipers.

Since flow is axial within pump, pumping is pulseless and non-foaming, and liquids with considerable air entrainement can be handled. Further, mechanical sealing is so effective that suction lifts up to 29 ft are developed.

Pump is made in meehanite (pearlitic form of cast iron), bronze, aluminum and all stainless steel with Buna N rubber-bonded parts.

Screw pump is available in three capacities: 15, 42 and 220 gpm. Each model has maxi-

mum discharge pressure of 100 psi and suction lifts up to 29 ft.

Units have tapered roller bearings on both ends of rotor shaft and operate at speeds up to 3600 rpm. Rotation is reversible.

Field Tests

Several successful field tests of screw pump have been recently completed. At a sugar refinery, it was used for handling magma, a suspension of sugar in viscous molasses. (Material is comparable to asphalt in viscosity and abrasiveness.)

When periodic samples were examined under microscope, sugar crystals were found undamaged. Abrasive action of crystals caused negligible amount of wear on rubber-bonded parts.

Other products successfully handled by pump in tests have been beer and wine, which were pumped without oxydation, and 250,000 SSU liquid wax with abrasive sand.

Supplier: Goodyear Pumps, Inc., Nine Rockefeller Plaza, New York 20, N.Y.

7573 on Reader Service Slip.

Pilot plant filter also designed for processing

Small-size filter unit, for pilot plant or development applications, is also designed for process operations where small flows are involved. Applications include a variety of process fluids such as water, brine solutions, demineralized water, etc.

Filtering elements of the LFH Filter unit are available in a wide choice of materials, depending upon degree of filtration desired.

Diatomaceous earth or similar filter aid can be used, if desired, to provide microscopic-size passages for filtering out the smallest particles including many bacteria and algae.

The cake is built up by continuous feeding of the filter aid to form a larger and larger filter area with continuous formation of new passageways. This greatly increases the filtering cycle before backwashing is required and provides high-polish filtration.

Complete cleaning by backwashing is greatly facilitated by "pressure dome" design of unit. To clean, the outlet valve on the empty filter is closed, building up pressure with the supply pump which traps air in the pressure dome. When backwash valve is released, an explosive cleaning action is accomplished with a minimum of backwash water.

Units have an on-stream flow rate of one to two gallons per minute per square foot of filter area. Depending upon liquid to be filtered and nature of solids to be removed, flow rates as high as four gallons per minute per square foot are possible.

Filters are available in 14, 18, 30 and 40 square feet of filter area.

Supplier: R. P. Adams Co., Inc., 432 E. Park Drive, Buffalo 17, N. Y.

7574 on Reader Service Slip.

Polyester filter plates, frames

Polyester filter plates and frames are described and illustrated in 2-page bulletin issued by T. Shriver & Co., Inc. The plates and frames are compression molded of a special premixed compound consisting of chopped Fiberglas, chemical resistant resin and inert fillers.

In certain critical areas, glass roving is used as reinforcement.

Plates and frames are not subject to corrosion or deterioration common to those made of coated metal.

While heat distortion of the polyester material does not take place below 300 F, a maximum working temperature of 250 F is recommended for plates. Where polyester frames are used with the plates, a maximum working temperature of 200 F is recommended, with operating line pressures limited to 75 psi.

Bulletin No. 149 provides complete information on the plates and frames with comparative data between polyester and stainless steel, aluminum, rubber, covered cast iron, cast iron and other materials.

7575 on Reader Service Slip.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW·

GARDNER-DENVER

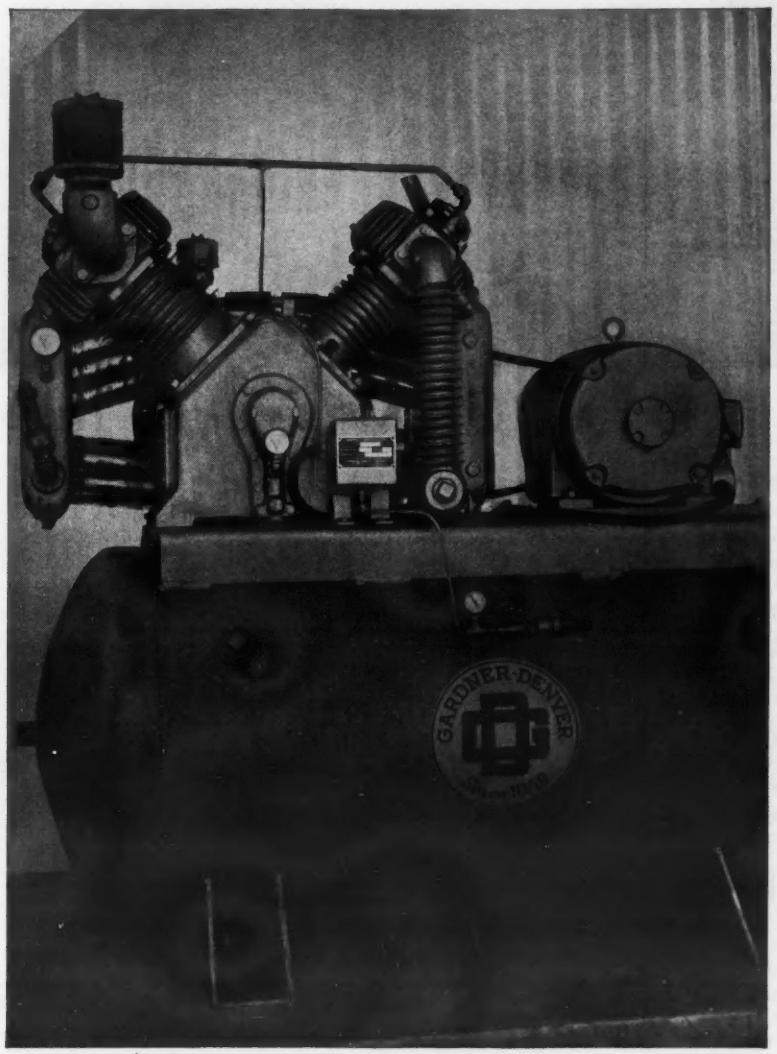
Since 1859

GARDNER DENVER

Here's one of the highest-capacity tank-mounted compressor outfits available—to provide low-cost air without adding a more expensive type of installation. It's the Gardner-Denver ADL—a two-stage, air-cooled, 20 hp, two-cylinder unit. In continuous service, it has a piston displacement of 100 cfm at 870 rpm. Discharge pressure up to 125 psi, or as high as 250 psi on intermittent service. Compressor alone also available. For information, write Gardner-Denver Company, Quincy, Illinois.

High-capacity outfit

for low-cost air



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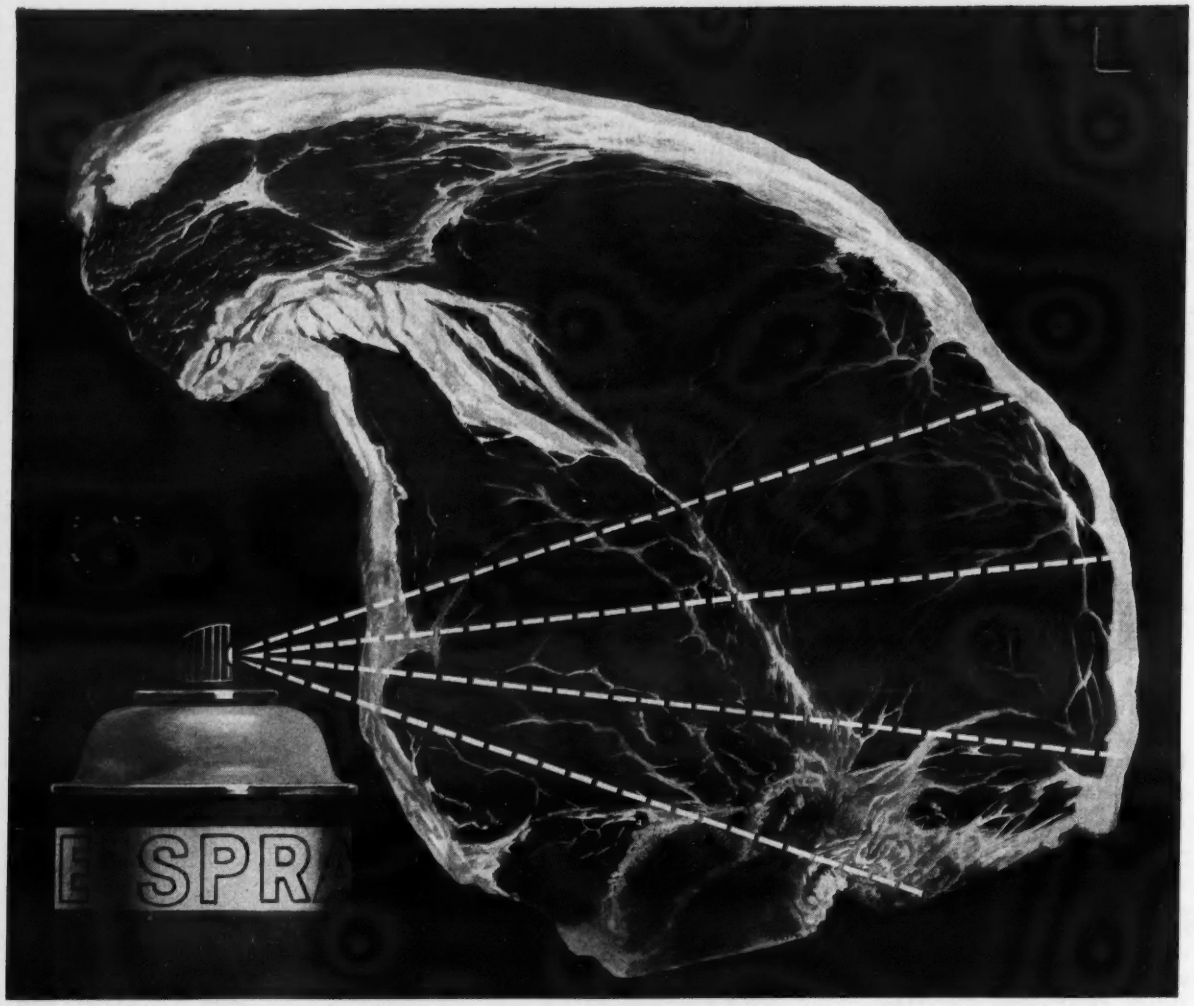


RHOZYME for tailored meat tenderizers

Here's your chance to get off to a good start in the new field of aerosol-packaged meat tenderizers . . . by using RHOZYME proteolytic enzymes, of microbiological origin. Unlike similar products derived from other sources, RHOZYME enzymes can be manufactured to a variety of specifications. They are adaptable to both liquid and powdered meat tenderizers. Basic formulations for both types are now available from our laboratories. The liquid tenderizers are "naturals" for packaging in spray dispensers . . . for convenient, logical, economical application. And since the use of aerosol cans in food marketing is a novelty, tenderizers sold in such containers should enjoy an excellent sales position on retail shelves.

The action of RHOZYME enzymes is also valuable in processing many other protein-containing materials. Examples include: modifying whey protein for cheese spreads; improving the baking characteristics of bread, crackers, cookies, pretzels; producing protein hydrolyzates for diet foods, breakfast cereals, pharmaceuticals; and converting protein wastes (e.g. fish solubles) to animal feeds. Write to Dept. SP-26 for useful suggestions on the use of these enzymes.

RHOZYME *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

RHOZYME

7577 on Reader Service Slip.

More straining area with all-nylon bag strainer

Uses: For straining emulsions, suspensions or solutions flowing by gravity or being pumped.

Features: Bag strainers are stated to provide three to four times as much straining area as conventional strainers and to be virtually non-clogging.

Cleaning of Fast-Flo bags is simple. All that is required is rinsing in suitable cleaner, turning bag inside out and shaking to remove any adhering material.

Description: All-nylon bags are made in two sizes. Large bag is approximately 18 in. wide by 28 in. long; smaller bag is approximately 13 in. wide and 15 in. long.

Both types are made in three mesh sizes: #20, #40 and #80 mesh. Specimens of nylon showing various mesh sizes are available.

Supplier: Fast-Flo Corp., 1707 Kings Highway, Brooklyn 29, N.Y.

7578 on Reader Service Slip.

Handle 300 F liquids with centrifugal pump

Double-suction, single-stage centrifugal pump can be used for wide variety of pumping services. It will handle water and other non-abrasive fluids at rates up to 60,000 gpm and against heads up to 400 ft.

Type A, horizontal split-case pump is designed for general purpose continuous duty. Line of pumps is subject of 18-page bulletin, available from Food Machinery and Chemical Corporation, Peerless Pump Division.

Literature has cross-sectional diagram pointing out design features. There are also several engineering diagrams indicating parts and alternate subassemblies.

For tentatively selecting equipment, twelve performance charts are included. Charts have curves showing capacity (gpm) vs total head (ft) for bottom and side suction pumps at different speeds.

7579 on Reader Service Slip.

Carbon dioxide and its uses

Carbon dioxide and its value to industry is covered in a 24-page booklet issued by the Pure Carbonic Co., a division of Air Reduction Co., Inc.

Liberally illustrated booklet covers history, principal applications, properties, manufacture, supply and distribution of carbon dioxide in gaseous, liquid and solid (dry ice) form.

Included is a discussion of Pure Carbonic's supply systems used to provide carbon dioxide according to user's particular needs. Flexibility and adaptability of these systems from a single cylinder of carbon dioxide to the large 100-ton capacity receivers are described.

Specialized regulating equipment and controls for carbon dioxide are also covered, as well as technical services available.

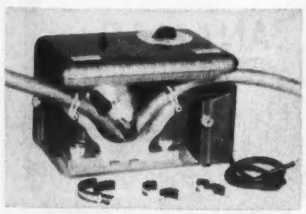
7580 on Reader Service Slip.

Valveless hose pump for fluids, powders

Uses: For pumping liquids, slurries, emulsions, powders or gases in laboratory or plant. Pump can also be used to pull vacuum.

Features: Self priming pump presents no cleaning problem since fluids move only in hose and complete unit can be sterilized.

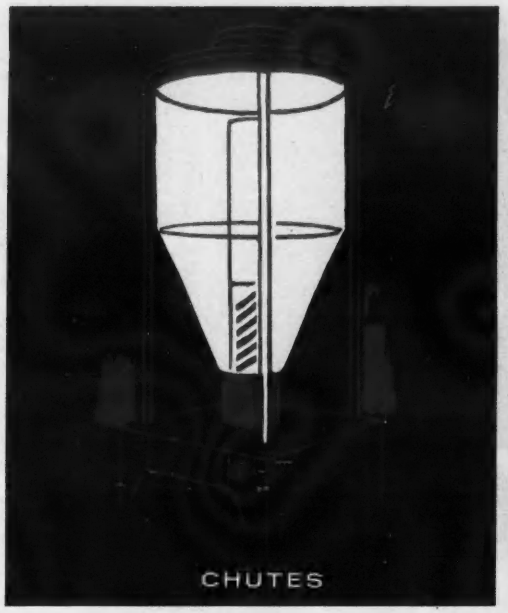
Pumping action is caused

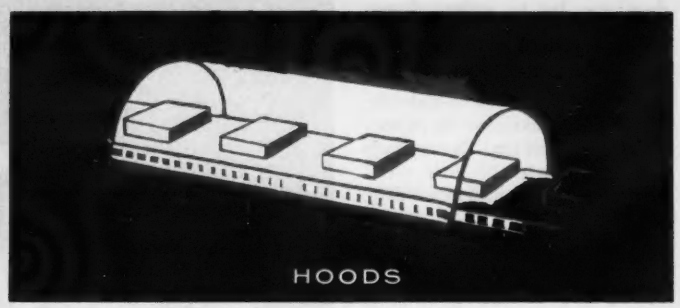


Pump's rollers are self-lubricating and are covered with nylon

by rollers which compress hose and move along it, thus moving product inside hose. There are no glands or return valves.

Because delivery is virtu-





Plexiglas keeps contaminants out—profits in!

clear sheets and transparent or translucent colored sheets. Authorized distributors are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

Windows, partitions, skylights and lighting shields in food processing areas are ideal glazing applications for PLEXIGLAS, the durable plastic that "gives" with a blow.

Machines, containers and conveyors can be protected from contamination, with transparent hoods, lids, covers and see-through sections of impact-resistant PLEXIGLAS.

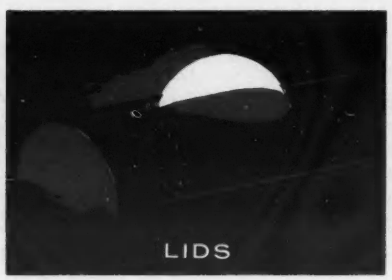
You don't have to worry about corrosion or weathering when you install PLEXIGLAS—available in crystal clear sheets and transparent or translucent colored sheets. Authorized dealers are listed under PLEXIGLAS in the Plastics section of telephone directories in major cities.

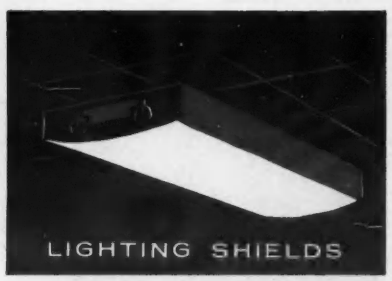
Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

In Canada: *Rohm & Haas Company of Canada, Ltd., West Hill, Ontario*





CALL YOUR AUTHORIZED PLEXIGLAS DISTRIBUTOR

PROMPT DELIVERY • TECHNICAL ADVICE • FULL RANGE OF SIZES AND COLORS

7581 on Reader Service Slip.

ally constant, pump can be used for metering. Its capacity ranges from a few cc to 500 gph.

Description: H. R. Flow Inducer has stepless variable-speed drive to regulate motor speed up to 200 rpm. Because of reversing switch on pump, flow can be in either direction.

Up to 1-in. diam hose can be used with unit.

Supplier: Schuco Scientific, Division of Scheler & Company, 75 Cliff St., New York 38, New York.

7582 on Reader Service Slip.

Spray dryer labs

Complete spray dryer laboratory facilities, available to industry for research, engineering, testing and custom drying, are described in 4-page bulletin No. 239.

Bulletin, which is available from Nerco-Niro Spray Dryer Div. of Nichols Engineering & Research Corp., illustrates four different size spray dryers in operation at the firm's laboratories.

Also shown in a photo of an analytical laboratory for on-the-spot analysis and evaluation of raw materials and finished products.

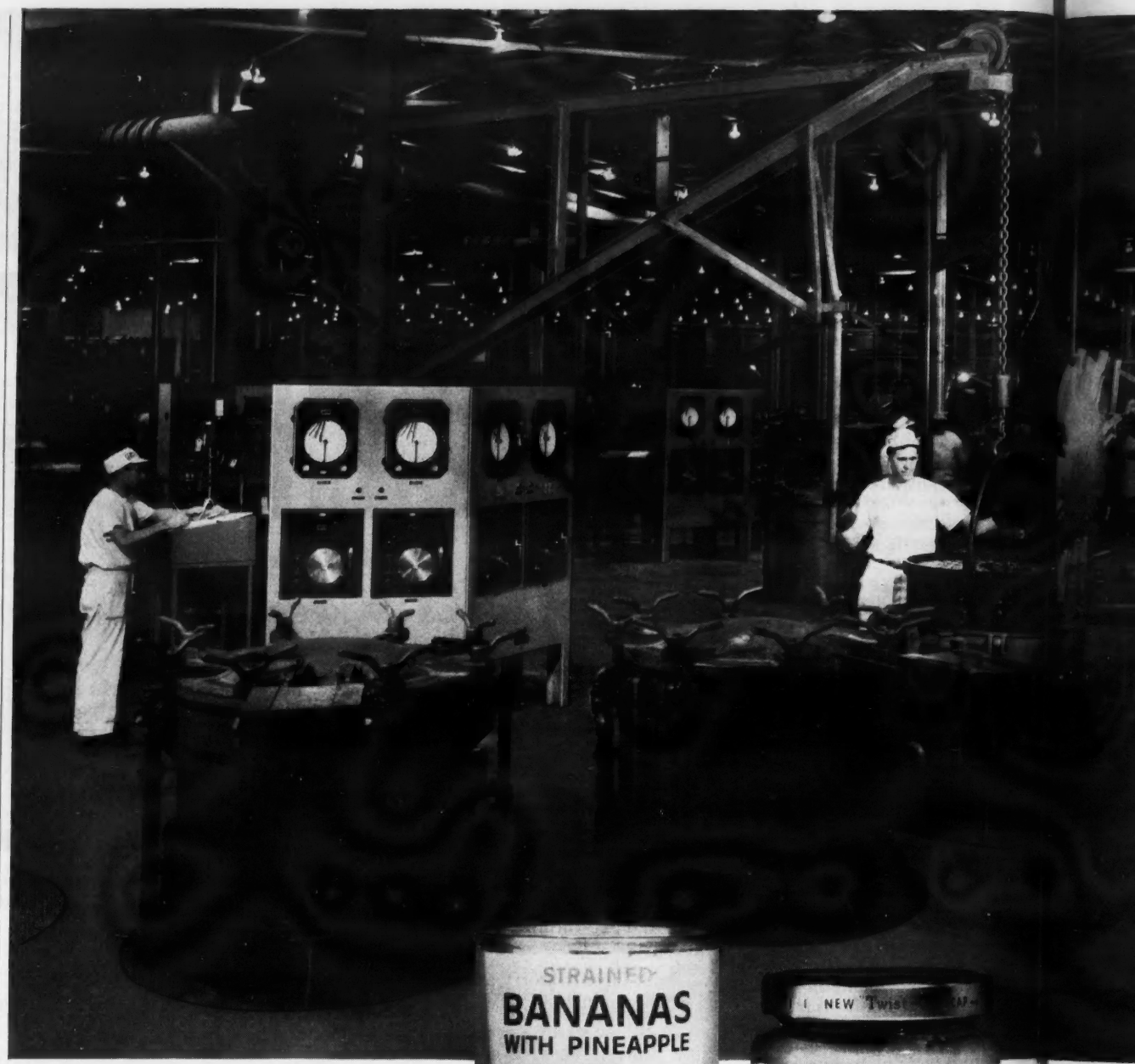
7583 on Reader Service Slip.

Sanitary, 500-gal polyethylene tank

Uses-Features: Storage tanks permanently resist corrosion; retain all other inher-

Tanks can be furnished with wide variety of access and drain fittings

ent characteristics of polyethylene. They need no out-



Completely automatic Taylor Retort Control System at the new Asheville, N.C., plant of the Gerber Products Company, FLEX-O-TIMER Timed-Program Controllers work in conjunction with FULSCOPE* Recording Controllers—proven dependable in over 20 years of service.*

*Reg. U.S. Pat. Off.

Taylor Instruments

Gerber's problem is our baby!

Famous name in baby foods

protected by Taylor Controls

In their new plant at Asheville, N. C., Gerber Products Company leave nothing to chance . . . or the possibility of human error . . . in processing their complete line of strained and junior foods. Retorting, for example, is a push-button operation. The Taylor SPW-7AV Fully Automatic Control System regulates temperatures throughout the pre-heat, cooking and cooling periods and times the entire cycle.

This Taylor system gives Gerber:

Maximum production from their equipment investment, because of minimum time loss between product changes.

Lowest possible processing costs, because retorts are used to maximum capacity and efficiency.

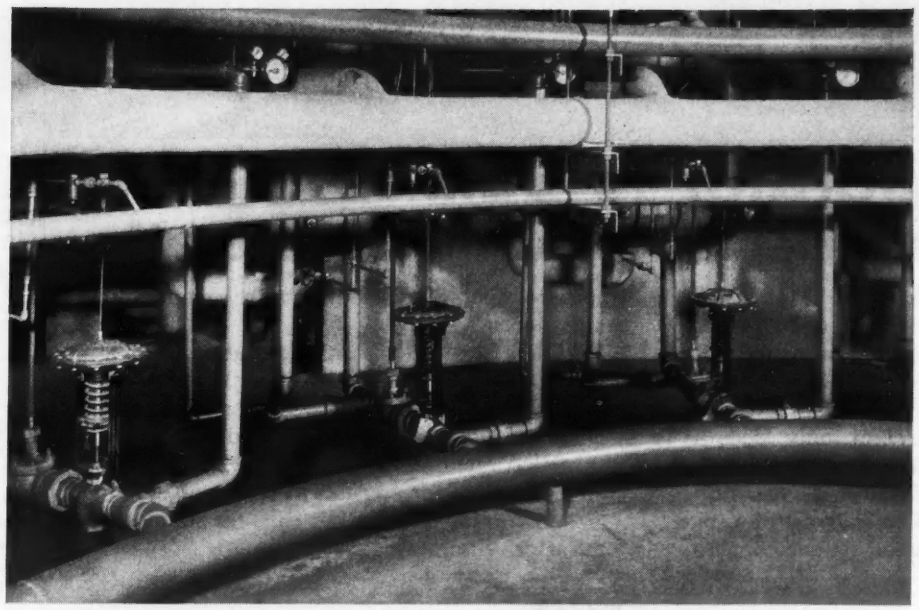
Uniformity of product, because fully automatic operation makes each cook identical.

This versatile control system can be changed in minutes from one form of cook to another. Vent, cook and cool time can be varied in seconds. It can be quickly adjusted to the processing requirements of any product or container size. Easy and economical to install, the unit is packaged at the factory. Requires only wiring and piping connections to instruments and valves.

* * *

Your Taylor Field Engineer can give you the benefit of years of experience in supplying control systems for every stage of food processing. Call him, or write for **Catalog 500.**

Taylor Instrument Companies, Rochester, New York or Toronto, Ontario.



Taylor Hi-Flow Maximum Capacity Valves in use on retorts at Gerber are sturdy, dependable, require minimum maintenance.

MEAN ACCURACY FIRST

7584 on Reader Service Slip.

side supports as proven in extensive field tests.

Tanks are approved by National Sanitation Foundation and Meat Inspection Division of USDA.

Description: Molded tanks are made in virgin natural polyethylene or black for outdoor storage.

They are available with full-open head, closed head with openings and flat or conical bottoms.

Supplier: Delaware Barrel & Drum Company, PO Box 1648-A, Wilmington, Del.

7585 on Reader Service Slip.

200 cu ft mixer receives, discharges materials pneumatically

Uses: For feeds and similar materials.

Features: Vertical mixer is specifically designed to receive and discharge materials by air; has no horizontal feed-in screw or vertical elevating tube in base.

A dust-tight paddle discharge gate is located at extreme lower end of mixer cone.

Description: Conveying air, entering mixer through top, is released through vent. Mixing of material is accomplished by standard elevating tube and Thor-Flow[T] baffle.

Mixer is mounted on steel frame work to accommodate connections for pneumatic materials handling system.

Supplier: Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

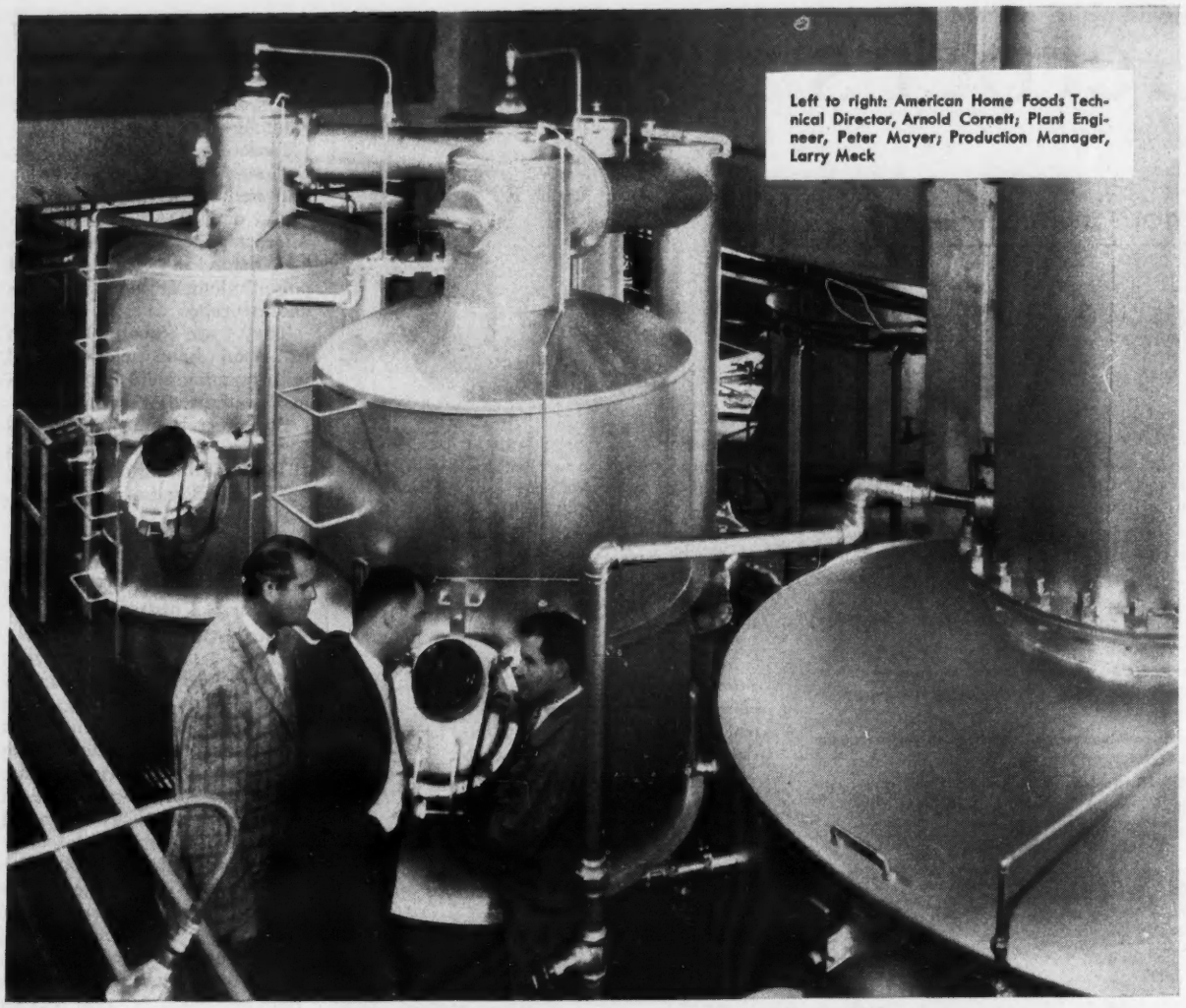
7586 on Reader Service Slip.

High-capacity, air-tight centrifuge performs three functions

Uses: For separating, clarifying or standardizing cold milk.

Features: When used for separating cold (40 F) milk, centrifuge has capacity of 10,000 lb/hr. When used for clarifying or standardizing, machine has capacity of 25,000 lb/hr.

Changeover from one oper-



Left to right: American Home Foods Technical Director, Arnold Cornett; Plant Engineer, Peter Mayer; Production Manager, Larry Meck

This evaporator is built to take it . . . it's made of stainless steel!

The installation above is the Buflovak Triple Effect Evaporator in the Oakland Plant of American Home Foods, Div. of American Home Products. Made by a leader in this field—the Buflovak Equipment Division of Blaw-Knox Co.—this unit takes plenty of punishment. Not only does it handle tomato paste with steam (both of which have a corrosive effect on ordinary equipment) but in peak periods it is pushed to 20% above its rated capacity. Yet this stainless steel evaporator continues to operate efficiently with a minimum of maintenance.

Stainless Steel is constantly called on to do a job where other steels fail. Because Eastern makes stainless steel exclusively, we are set up to offer technical assistance as well as the distribution and production facilities to deliver exactly the type of stainless needed for any fabricating problem.

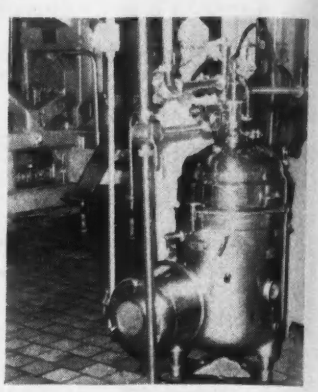
When you have a job that calls for stainless, call for Eastern Stainless.

Mr. A. F. Cornett,
Technical Director, American Home Foods, Oakland, says:

"Stainless steel proved out for us. It does a great job and helps us maintain product quality."

EASTERN
STAINLESS STEEL
BALTIMORE 3, MARYLAND, U. S. A.
Stainless steel sheets, plates, strip, coils

7587 on Reader Service Slip.



Separator has hermetic discharge of both cream and milk

ation to another is accomplished by simple adjustment of finely calibrated valves. Switch can be made while centrifugal is running.

Description: Westfalia Tri-Purpose hermetic separator has large disc area and bowl that is designed for low feed pressure.

Supplier: Centrico, Inc., 75 W. Forest Ave., Englewood, N.J.

7588 on Reader Service Slip.

Cutter delivers up to 1/3 more corn

Large cut-corn-recovery increases and upgrading of quality have been obtained by using a cutting machine, known as the C-8 Tuc Cutter, to remove corn from the cob in commercial processing.

Cutting machine is extensively described and illustrated in a 16-page bulletin issued by The United Company.

Generally, through the use of the cutter, the number of canned cases (or pounds of frozen corn) per unshucked ton has been upped from between 20 and 33 1/3%, when other conditions remained the same. At the same time, end-product-quality has been upped in many instances by from one-half to a full grade.

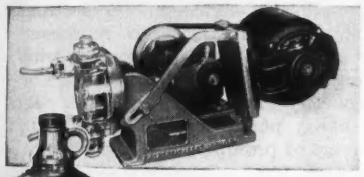
Details of numerous improvements and developments on the cutter are fully covered in the bulletin. Many diagrams are used.

7589 on Reader Service Slip.

New Low Cost Chlorinated Water Supply FOR FOOD PROCESSING PLANTS

KLENZADE

KLENZADE
IN-PLANT WATER
Chlorination



★ SIMPLE EQUIPMENT
★ LOW COST CHLORINE
★ "SPOT" LOCATION

Completely automatic feeding of Klenzade XY-12 Liquid Sodium Hypochlorite into your water line with a %Proportioneers% Heavy Duty Midget Chlor-O-Feeder. Low initial equipment costs, simple installation for any section or entire plant system. No skilled operator needed, no gas risks, no maintenance of elaborate equipment. Solution strength easily adjusted for clean-up time. Get the facts on this popular Klenzade "Package" and why it is ideally suited for your food processing operations.

COMPLETE
Sanitation Programs

Branch Offices in Principal Cities
KLENZADE PRODUCTS, INC.
BELOIT, WISCONSIN

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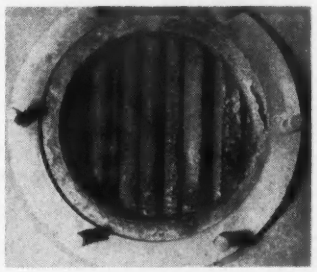
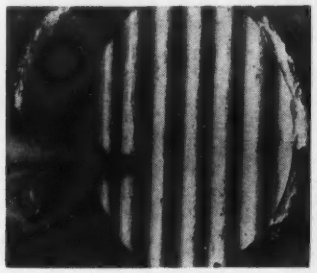
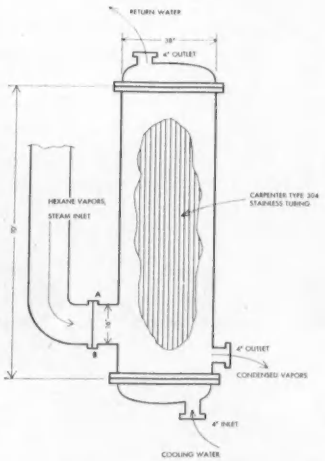




Above view shows condenser tubing as seen through opening at vapor inlets (A-B on accompanying diagram). After two years service at soybean extraction plant of Funk Bros. Seed Co., admiralty tubing on the left showed heavy corrosion attack from hexane vapors, steam and amino acids, resulting in failure. Type 304 stainless steel tubing on the right, which was used to replace the admiralty tubing in the condenser, shows no sign of corrosion attack after more than 5½ years service

Longer life justifies extra cost of thin-wall SS condenser tubing

Eliminates costly production interruptions at soybean extraction plant of Funk Bros. Seed Co.



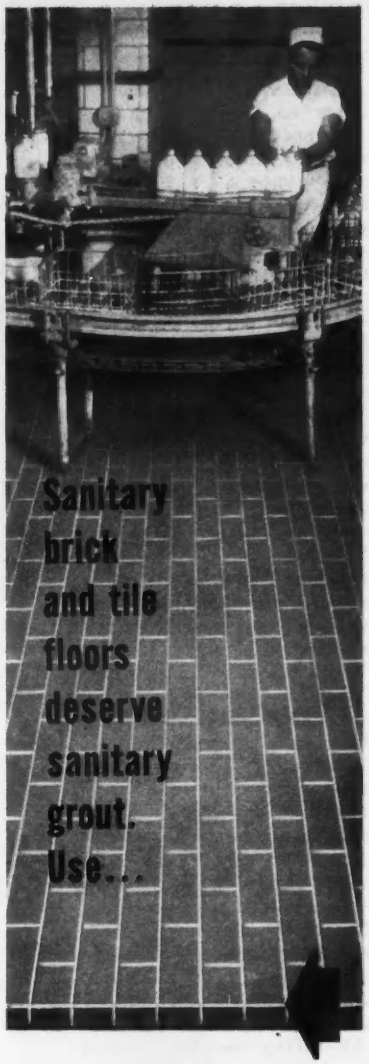
Cutaway view shows position of tubing in a typical solvent extraction condenser used by Funk Bros. Seed Co. in the production of soybean oil. Evidence of corrosion of admiralty tubing, used in original condensers, was first noted at vapor inlet A-B

PROBLEM: In 1951, Funk Bros. Seed Co., Bloomington, Ill., a large processor of soybeans, built a continuous, automatic plant for removing oil from soybeans.

Essentially, the process involves flaking the soybeans and then soaking them in hexane solvent to remove the oil. With the hexane process, 95 to 97 per cent of the oil is extracted from the bean.

Condensers are required in the operation to recover the hexane solvent after it has been evaporated from the extracted flakes and from the oil-solvent mixture produced in the extractor.

When the plant was first opened, condensers were equipped with phosphorized admiralty tubing. In the course of regular inspection, evidence of corrosion near condenser vapor inlets (see A-B on diagram) was discovered. This led to installation of baf-



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JOINT FILLER

HYDROMENT JOINT FILLER improves new or old tile floors three ways: provides permanently tight joints; greatly increases resistance to the corrosive action of alkalies and bacteria; inhibits development of food acids. Non-toxic and odorless, HYDROMENT JOINT FILLER requires little maintenance. Available in most wanted colors. Write for catalog.

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7591 on Reader Service Slip.

fles at the vapor inlets.

Even so, after only two years operation, corrosion damage to tubing from steam, hexane vapors and amino acids was so great that the plant was required to shut down three days for repairs.

Considering that Funk Bros. processes over four million bushels of soybeans yearly (about 400 tons daily), any interruptions to production are very costly.

Hoping to overcome this problem, condenser tubing of annealed 85-15 red brass was installed. But in two more years, fatigue failure occurred again.

Solution: To avoid simi'ar repetitions, plant manager Delmar D. Walker decided to make a careful analysis of the corrosion problem.

Under his direction, samples of red brass, admiralty, 70-30 cupro nickel and stainless steel tubing were suspended inside an operating condenser for three months.

Because stainless quality varies from one manufacturer to another, tubing made by several stainless producers were included in the test. After three months, all sample tubing sections were removed from the condenser and sent to an outside laboratory for corrosion analysis.

All tubing showed signs of corrosion except stainless types 304 and 316. After careful examination, Funk Bros. chose type 304, 18 gage by ¾ OD, supplied by The Carpenter Steel Co., Alloy Tube Div., Union, N. J., because it was the least expensive of the two alloys.

Results: While cost of stainless steel tubing is 1½ to two times more than admiralty, five years have elapsed since the stainless tubing was installed and, according to Mr. Walker, they are as good as new.

Four of the six condensers in the system at Funk Bros. have been refitted with stainless tubing. The two remaining condensers do not take as much load as the others. But even they will be changed over to stainless tubing in another two or three years.

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ANNOUNCING A NEW CORPORATE NAME

for The Garlock Packing Company

Garlock Inc. becomes the new name for The Garlock Packing Company, Palmyra, N. Y., to reflect more accurately its broad diversification of products and markets.

Originally established to manufacture mechanical packings, Garlock now produces over 2,000 different styles of packings, gaskets, seals, molded and extruded rubber and plastic products for every major industry.

The new corporate name, Garlock Inc., more closely identifies this 73-year-old company with the growth and development of its product lines. *Today, industry goes to Garlock for such widely diversified products as:*

- Hydraulic-Pneumatic Packings
- Oil and Grease Seals
- Gasketing and Expansion Joints
- Braided Packings
- Molded and Extruded Rubber Parts
- Plastic Stock Shapes and Fabricated Parts
- Mechanical Seals for Rotating Shafts
- Metal Packings
- Leather Packings
- Electronic Components
- Dry Bearing Materials
- Fluorocarbon Tank Linings
- Missile and Rocket Components

To help you in selecting or applying these products, Garlock offers the services of over 126 thoroughly-trained sales engineers, 175 electronic component manufacturers' representatives, 180 authorized bearing distributors and 69 foreign distributors. Conveniently located warehouses and stocking points assure Garlock customers of prompt delivery.

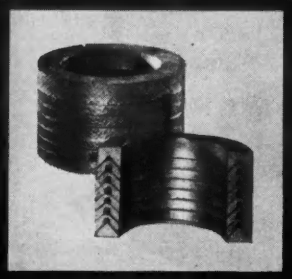
At Garlock Inc., design and development of new or improved products and materials is an ever-present objective. To this end Garlock maintains extensive research and laboratory-test facilities. In addition, Garlock engineers and chemists are always ready to work with you in seeking solutions to tough application problems.

GARLOCK

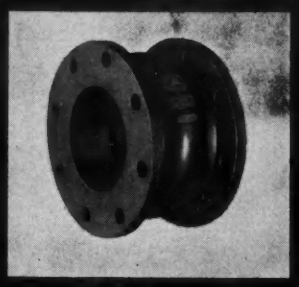
To find out more about "the new Garlock," call the nearest of our 26 sales offices, or write to Garlock Inc., Palmyra, N. Y. *To assure prompt attention,* please refer to *Garlock Inc.* on all future correspondence and orders.

Canadian Div.: Garlock of Canada Ltd.

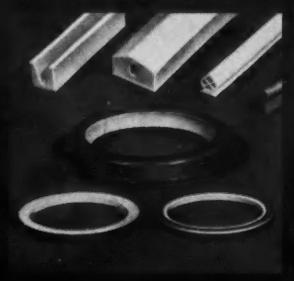
Order from the Garlock 2,000 . . . two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products.



Hydraulic-Pneumatic Packings

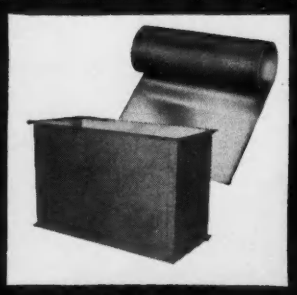


Expansion Joints

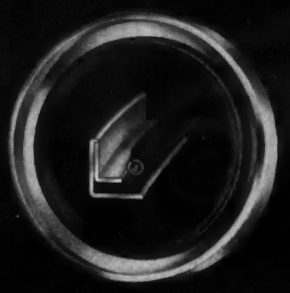


Molded and Extruded Rubber Parts

Plastic Stock Shapes and Fabricated Parts



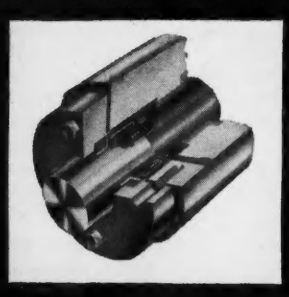
Fluorocarbon Tank Linings



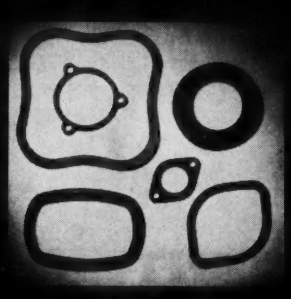
Oil and Grease Seals

Braided Packings

Metal Packings

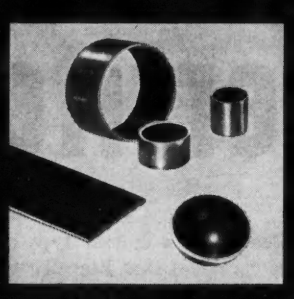


Mechanical Shaft Seals



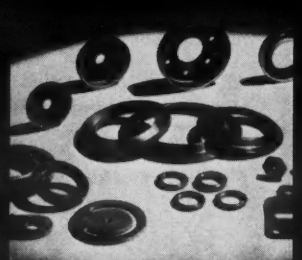
Gasketing

Spiral Wound Gaskets

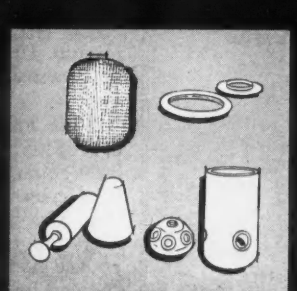


Dry Bearing Material

INC.



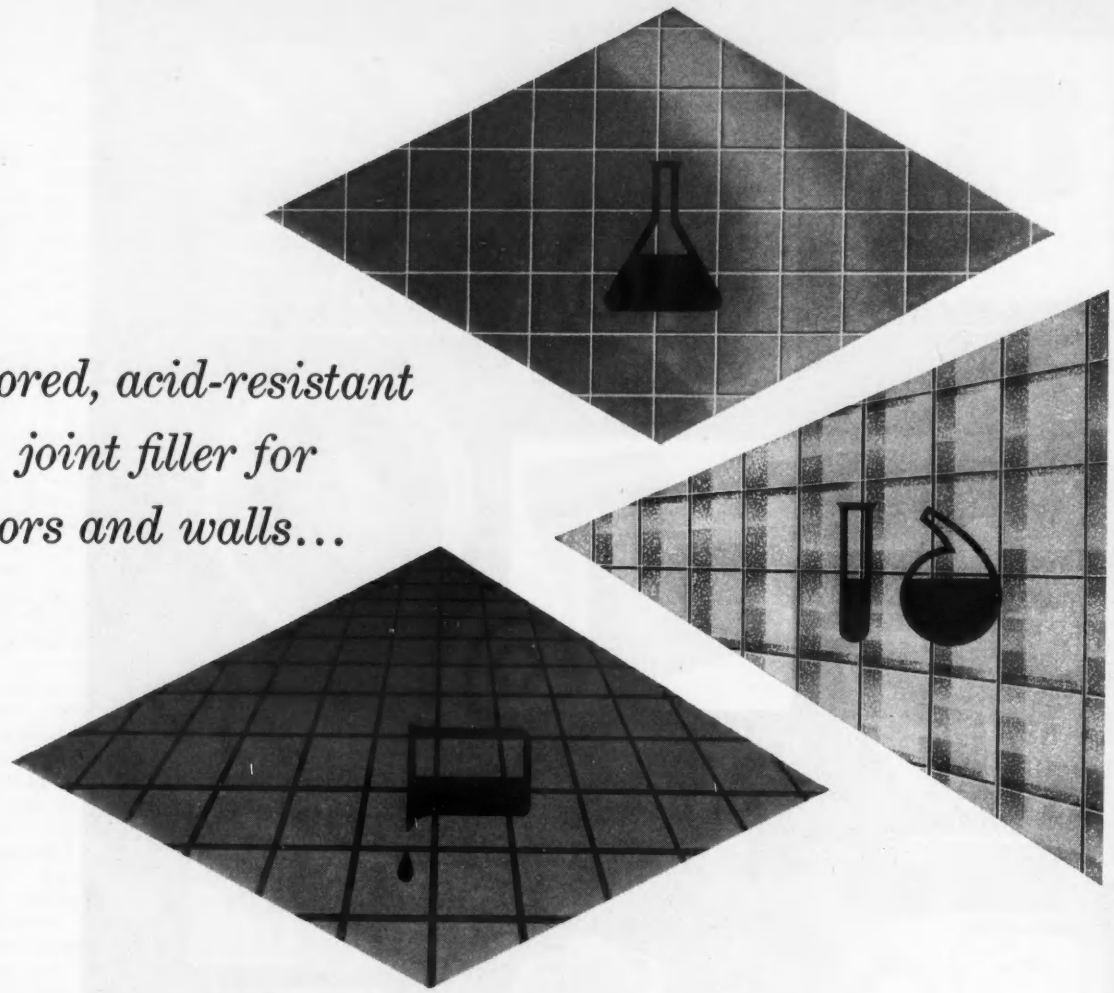
Leather Packings



Missile and Rocket Components

Electronic Components

For more information on product at left, circle 7593 see information request blank opposite last page.



Colored, acid-resistant joint filler for floors and walls...

Supertite GROUT CEMENT

Supertite Grout Cement is a mortar type acid-alkali resistant grout cement that literally welds brick, tile or glass block together, resulting in a perfect, permanent floor or wall.

Supertite is immune to attack by food acids and will easily withstand cleaning solutions, organic chemicals and water. It is easily cleaned and sanitary and will not deteriorate with age. Supertite is permanent as the tile itself.

Supertite is an ideal cement for both new and old jobs because it sets quickly and bonds permanently, yet cleans easily before setting... will not discolor or damage tile.

Add years of service to walls and floors and eliminate contamination problems with Supertite ...available in three attractive colors.

For information write:

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Sprays materials of trowel consistency up to 10 times faster

Low-pressure, high volume air spraying gun will spray materials of trowel consistency on floors and walls three to ten times faster than conventional application methods.

Designed to handle such heavy-bodied epoxies as Penntrowel, a corrosion-resistant thermosetting coating, it may also be used for applying stucco, sand finish plasters, colored aluminum and all aluminum-filled roof coatings, latex-based materials, etc.

Low pressure and high volume of air principle makes it possible for spray gun, called QuickSPRAY, to handle a wide range of epoxy formulations with or without aggregate.

Portable equipment, which may be easily assembled, has an output of ten cubic feet per minute. Unit may be adjusted for gravity or pressure spraying.

View of spray gun in operation. Note aluminum, cone-shaped hopper above gun which holds 1½ gallons of material being sprayed. Opening between funnel on hopper and the spray gun is ample for easy flow of heavy material

With low aggregate or no aggregate, gravity unit covers 8000 square feet with a 1/32-inch coating in an eight-hour day. Using the pressure unit, with high aggregate, 5000 square feet of 1/16-inch coating can be applied in the same time.

Power for a rotary type

compressor is provided by a 2½ hp gasoline engine or a ½ hp electric motor.

Snap connections for standard air hoses, and interchangeable orifices with rubber inserts makes maintenance and cleaning easy. Average cleaning time is five minutes.

Unit includes interchangeable high carbon rubber nozzles and three sizes of air plunger air tips to provide various degrees of spray. Also included with standard gun are two aluminum, cone-shaped hoppers so that mixing and spraying can proceed without interruption.

Supplier: Pennsalt Chemical Corp., Corrosion Engineering Dept., Natrona, Pa.

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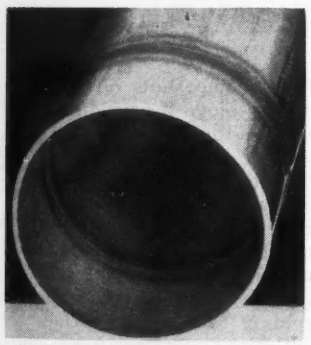
Sanitary tubing welds made automatically

Stainless steel tubing and fittings can now be automatically welded with a Mark II welding machine which will leave internal surfaces of tubing absolutely sanitary. Weld contains no craters or pits to harbor bacteria.

Welding machine is suited for installations in CIP sanitary systems and for maintenance work in dairies or other food processing plants. It is now being used in actual



End view of pipe welded on automatic sanitary welder. Weld is completely smooth on the inside, making it absolutely sanitary since it can harbor no bacteria. Outside weld is smooth and neat in appearance, with a mild discoloration which may be buffed to a polished surface if desired

big performer

---in the small pump field

COMPACT, MULTI-PURPOSE "K" Line Motorpumps are designed with the same "custom engineering" reflected in the largest Ingersoll-Rand pumps. And in all types of installations the rugged "K" Line is proving its dependability and efficiency.

"K" Line Motorpumps are stocked by Ingersoll-Rand distributors for fast, off-the-shelf delivery to meet any specification from ⅓ to 25 hp, up to 775 gpm, heads to 190 feet. Every pump is boxed and labeled and ready for immediate hookup.

For complete details on the I-R "K" Line Motorpump write today for latest catalog data. Or see your I-R Distributor.

a century 1860 – 1960 of pump progress

from the leading manufacturer . . .

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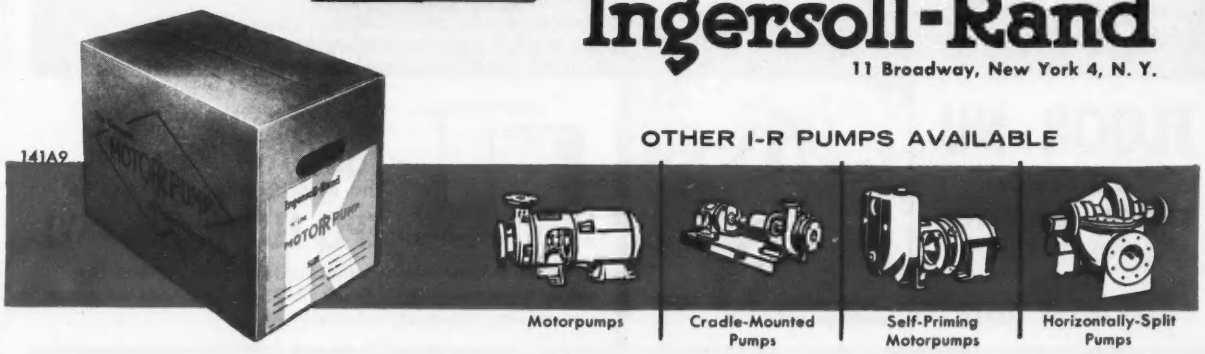

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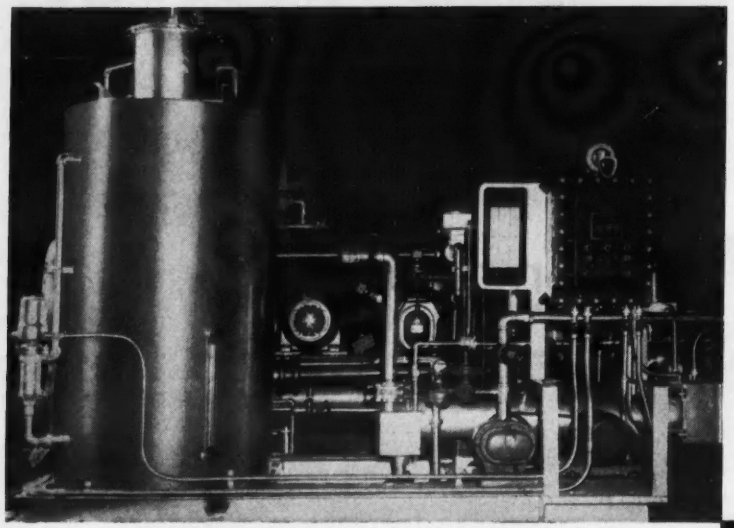
gas Atmospheres, inc

The nation's largest manufacturer of packaged gas generator systems.

PERFORMANCE SELLS PROCTER & GAMBLE ON PACKAGED GAS GENERATOR SYSTEMS



Procter & Gamble's experience with this packaged nitrogen gas generator system at their Sacramento, California, processing plant has led to the purchase of two similar units for other Procter & Gamble plants. These compact, easy-to-operate units have successfully met Procter & Gamble's requirements for quantities and gas purity. What's more, Gas Atmospheres' engineering service has been "most satisfactory", according to Procter & Gamble engineers.

Gas Atmospheres engineers know food and food processing atmosphere needs. Put this experience to work for you—more food processors do. Simply write or call *Gas Atmospheres, Inc., 3855 West 150th Street, Cleveland 11, Ohio.*

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Steelcote

THROUGHOUT AMERICA PLANT MAINTENANCE MANAGERS CHOOSE

DAMP-TEX WET WALL ENAMEL

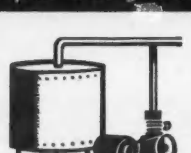
TRANSFORMS WET, ROTTING WALLS TO SANITARY BEAUTY

SEND FOR DETAILS OF NO-RISK TRIAL OFFER: Prove Damp-Tex's superiority in your own plant.

This bactericide, fungicide system is a pioneer and leader in its field. Its efficient, durable performance in thousands of plants is your best guarantee of satisfaction.

FLOOR-NU STOPS FLOOR DAMAGE FROM ALKALI, ACIDS AND HEAVY LOADS

SEND FOR NO-RISK TRIAL QUANTITY. Send for 26-lb. unit. Use half. If not satisfied return balance prepaid for credit on entire unit.



To Prevent Chemical and Water Corrosion of EQUIPMENT The Most Permanent Finish Is EPO-LUX 100 (EPOXY)

Protects where chemical liquids or fumes eat up other type coatings. Dries to 75% hardness of glass yet resists chipping or cracking.

STEELCOTE MFG. CO. 3418 GRATIOT ST. ST. LOUIS 3, MO., U.S.A. RODNEY, ONTARIO, CANADA

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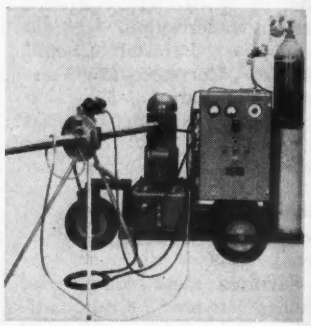
dairies and has received approval from a number of city health departments.

Portable unit, which can be rolled through any 29 inch opening, will make sanitary welds on tube and fittings from 1½" to 4" in size.

In operation, the welding fixture of the machine is clamped to tubing at the joint to be welded and the start button on the control panel is pushed. (See accompanying photograph of machine). Operator then simply waits until



Over-all view of welding machine. Welding fixture, which is clamped to tubing where joint is to be welded, rotates at a predetermined regulated speed around the tubing. Tubing remains stationary. Tube axis may be in any position from horizontal to vertical. Unit is designed so that anyone can weld sanitary joints after five minutes of instruction

the machine shuts off so that he may move the welding fixture to the next joint to be welded.

Control panel of unit includes a manual position so that the welding generator may be employed to weld any materials other than tubing by the addition of manual welding cables and torches.

Welder operates from 220 volt, 60 cycle, 3 phase power connection.

Supplier: Cycl-O-Magic, Inc., 1736 N. Second St., Milwaukee 12, Wis.

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Check page 115 for helpful technical literature

Engineering data book on timing belt drives

Complete and detailed information on the selection, design, installation, operation and maintenance of timing belt drives is included in 56-page catalog No. DTE-1, available from R. & J. Dick Co., Inc.

"'Timing' Belt Drives", which provide for positive power transmission by the tooth grip of the belting on the matching sprocket, aid in overcoming many belting drive problems such as friction and backlash, and loss of power through belt slippage.

Typical uses are described and illustrated and specification selection tables are included in the catalog.

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Filter has service life six times longer than conventional units

Field tests with replacement air filter units, constructed in shape of a cube, show service life to be at least six times longer than conventional throw-away and permanent metal type filters.

Units, known as ULOK Cube Air Filters, have application in air conditioning and heating systems, dust entrapment and process air systems.

Filters combine increased capacity for dust entrapment with exceptionally low pressure drop.

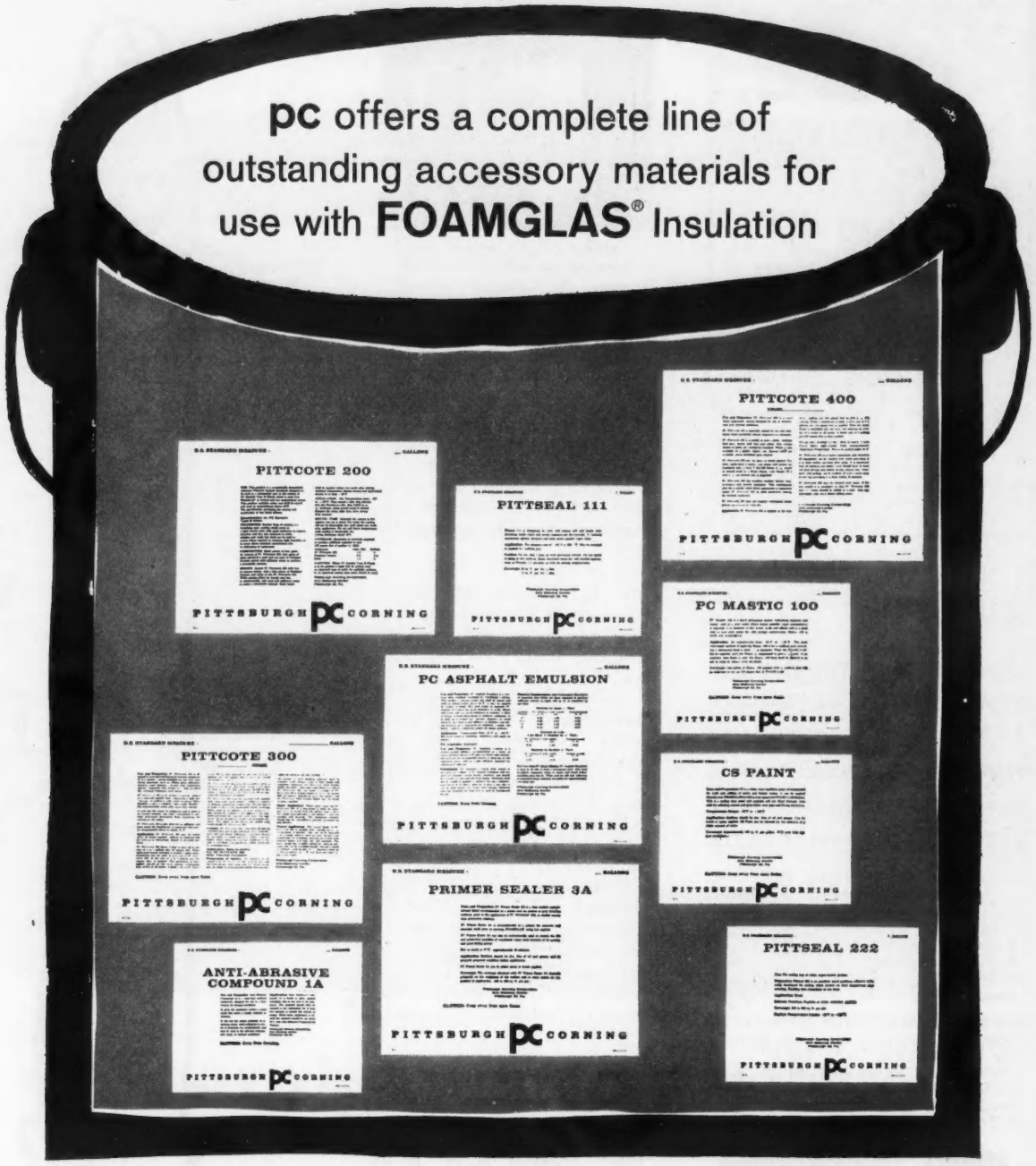
High capacity filtering action of units, is attributed to a light weight synthetic filtering medium, filter bat which is sewn on four sides to produce a cubic configuration and the open side construction of the entire unit. (See photograph)

In operation, air stream carries dirt into cube to front surface of the downstream face of the filter. As dirt builds up on downstream face, air flow is shunted to sides of the cube.

Coarse material continues to be caught on downstream face of filter, while large filter area

never ruin a good insulation job with inferior accessories....

pc offers a complete line of outstanding accessory materials for use with FOAMGLAS® Insulation



In many installations, the insulation is only as serviceable as the accessory materials used to install it and finish it. That's why Pittsburgh Corning has made available a complete line of insulation accessories specifically designed to insure the natural high performance of FOAMGLAS.

From mastics to finishes to angle pins and lath clips, each accessory has been selected to function perfectly with cellular glass insulation. They assure you the same permanence and satisfaction you always get with FOAMGLAS. Write today for a set of PC Accessory Material Data Sheets; Pittsburgh Corning Corporation, Dept. FP-60, address One Gateway Center, Pittsburgh 22, Pennsylvania.

PITTSBURGH pc CORNING

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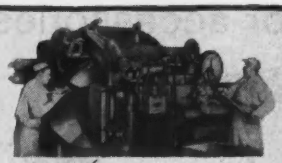

"THIS LUBRICANT INCREASED BEARING LIFE FROM 2 WEEKS TO 2 YEARS"

—says THE GLOBE COMPANY

"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

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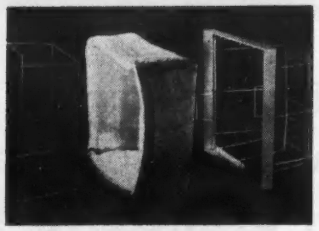


Filtering unit is made up of three components. Shown at left, above, is rust-proof retainer wire, which fits into the filter medium to hold it rigid; in center is disposable synthetic filter medium; and at right is metal basket which encases medium

of four sides traps fines.

Results of this progressive "reverse loading" is that unit shows an unusually low pressure drop even after it has collected several pounds of dirt.

A 20″ by 20″ by 20″ filter unit is rated at 0.04 inches pressure drop at 2000 cfm, offering users low pressure drop in a high velocity system.

In addition to unit with face area of 20″ by 20″, already mentioned, units are also available with standard face areas measuring 20″ by 25″, 16″ by 20″ or 16″ by 25″.

For each of these there are units that measure 8, 11 and 20 inches in the direction parallel to the air stream.

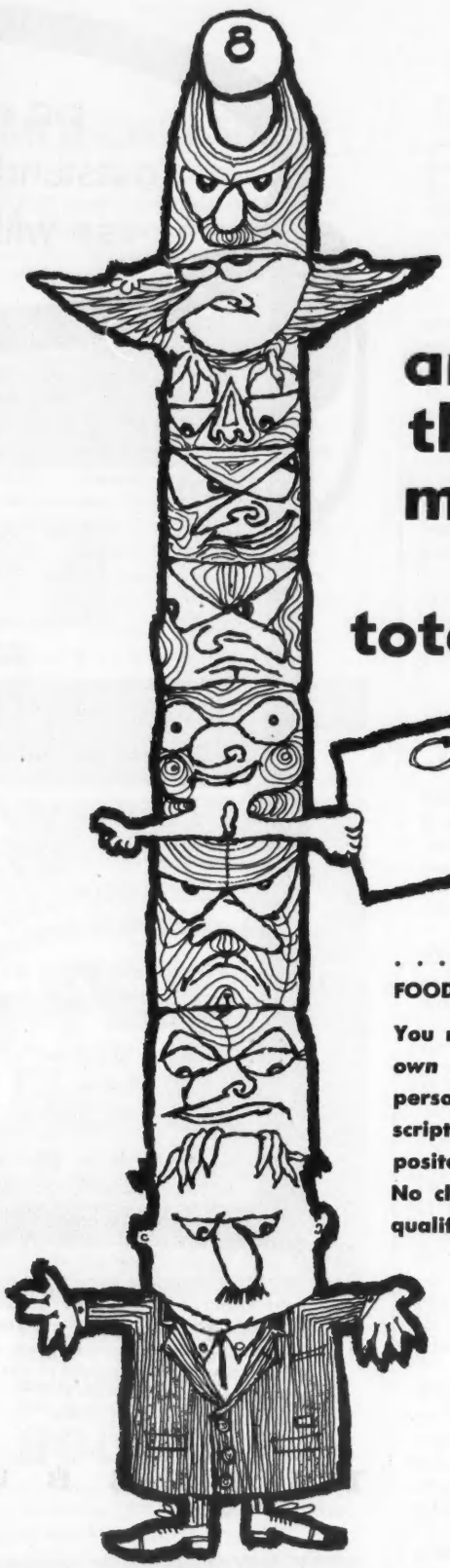
Supplier: Union Carbide Development Co., Division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

7603 on Reader Service Slip.

Guide to selection and sizing of strainers

An 88-page handbook, entitled "Strainer Guide", as an aid in simplified selection and sizing of strainers, has been published by Tate Engineering, Inc.

Handbook is divided into sections which contain complete information on specifically designed strainers. Each section opens with a fold-out page containing reference material (specifications and data, strainer materials, basket materials, flange standards, etc.) which may be easily used with any specific page within



are you the low man on the totem-pole

. . . always last to receive FOOD PROCESSING?

You needn't be. To get your *own* copy, addressed to you personally, fill out the subscription request form opposite the inside back cover. No charge, of course, if you qualify.

the section.

The guide contains over 100 illustrations of pressure drop, temperature and viscosity charts made from actual testings, in addition to engineer drawings of the full range of strainers.

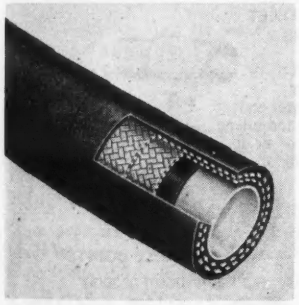
While information is arranged in the guide for simplified use by purchasing agents, all technical data necessary to the engineer for layout of fluid flow systems, valves and pipe selections, etc., are included.

7604 on Reader Service Slip.

Hose for all liquids is easy to clean, sterilize

Teflon lined hose, called Flexlon, has particular application for handling milk and liquid foodstuffs, including corrosive materials.

Since nothing will stick to the waxy Teflon tube hose liner, cleaning and sterilization are easily accomplished. In addition, hose also features good flexibility.



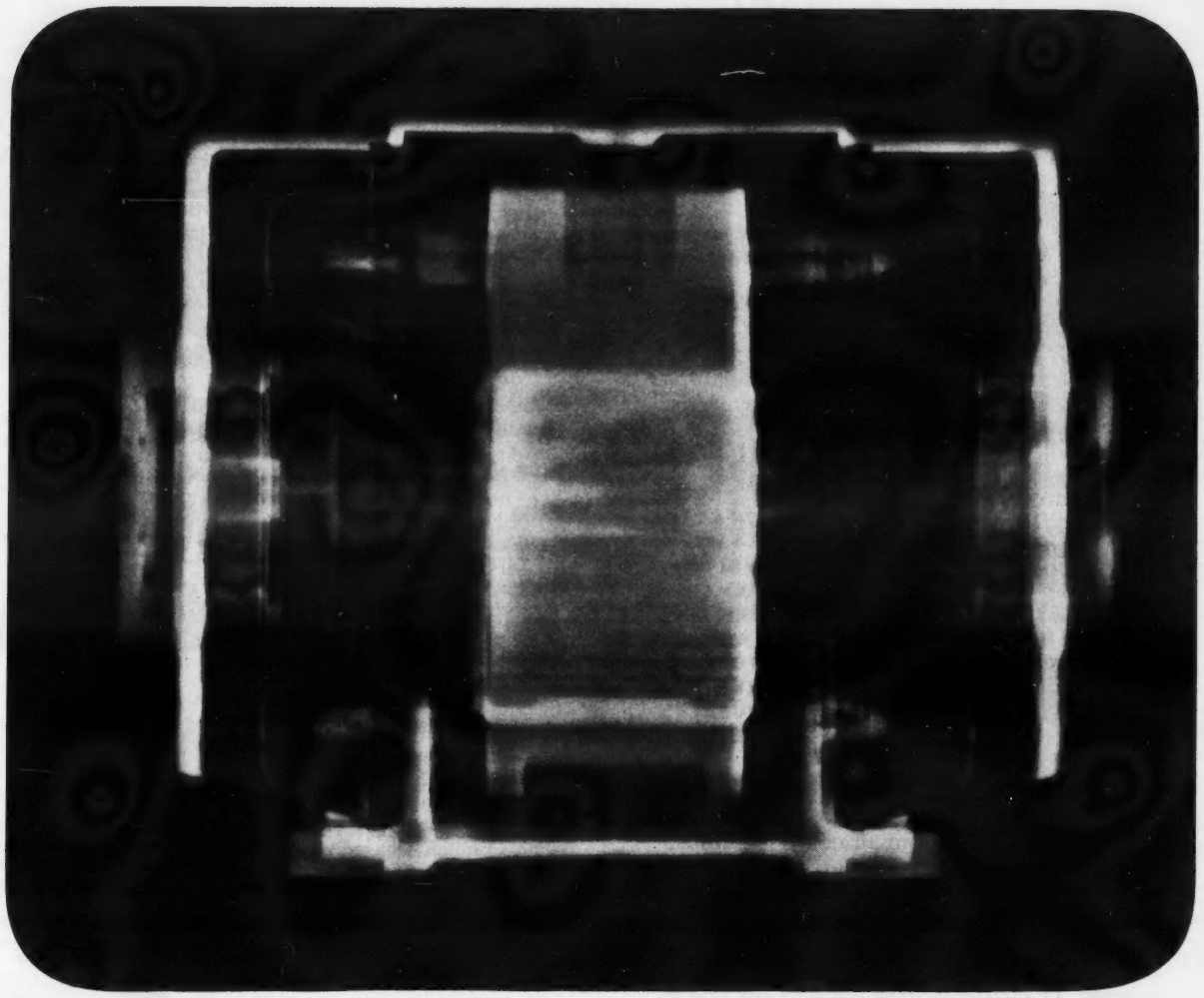
Cutaway view shows inner Teflon lining tube which is bonded to the hose body. Special bonding eliminates separation, cracking or splitting even with small bending radii. Plies of high tensile cotton cords or special braided steel wire (depending upon pressure or temperature requirements) are bonded to the tube and heavy-duty cover to form strength members

Depending upon size and type of hose, it may be used with temperatures to 325 F and working pressures to 1500 psi.

Standard sizes available are in diameters to 1¼" and in 15 to 50 foot lengths, depending

ALLIS-CHALMERS

A-1337



Actual radiograph of a 5-hp open-type motor taken with a 24-million volt Allis-Chalmers Betatron.

X-ray view of motor health

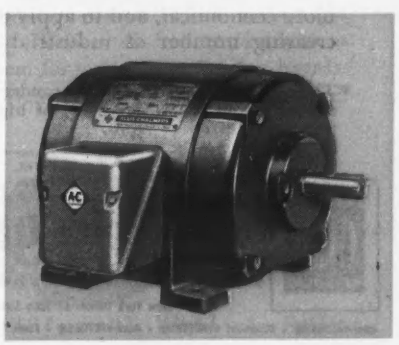
Invisible standards of perfection increase life expectancy of every Allis-Chalmers motor

The exceptionally long performance of A-C open motors proves the value of thinking *beyond* established standards of design . . . of taking "significant new achievement" as the ideal.

This ideal led to many refinements for A-C open motors: double-shielded bearings that keep dirt out and allow controlled migration of grease, permanently numbered lead spacer and leads for easy identification and connection, and heavy-duty cast iron frames that resist corrosion and keep rotating parts perfectly aligned.

For totally-enclosed, open-type and *Super-Seal* general purpose motors, and electrically or mechanically modified definite-purpose motors, choose the motor built to invisible standards of perfection. Choose A-C. Special application help available.

Call your nearby A-C representative. Or write **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.* Super-Seal is an Allis-Chalmers trademark.



7605 on Reader Service Slip.

upon size. Larger sizes can be supplied on special order. Hose can be equipped with either brass or stainless steel fittings.

Supplier: Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.

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Adhesive tightly bonds without clamps, pressure

Flexible, waterproof, chemically resistant adhesive that will bond to almost any type surface, is described in 10-page booklet on "Wherever an Adhesive is Needed".

Feature of adhesive is its contact bonding. When two coated pieces are joined, there is an immediate "grab" with no need for clamps or pressure. Assembly can be placed into service without delay.

Booklet published by Carboline Company, contains suggested uses for metals, structural materials, plastics and miscellaneous materials such as glass, etc.

Suggested uses and directions for use are illustrated in line drawings. Known as Neoprene Adhesive F-1, the product is a development of Carboline Company, based on the Du Pont elastomer commonly known as "neoprene".

7608 on Reader Service Slip.

"Stop mumbling . . what fell in?"

ENGINEERING PERSPECTIVE THROUGH A

VENTURI

Venturi tubes were first used for measuring fluid flow. While this application has increased substantially, the use of the Venturi in important unit process operations has increased even more. A Jet-Venturi combination is literally the heart of many important manufacturing processes.

JET REFRIGERATION
JET COMPRESSORS
JET CONDENSERS
JET HEATERS
JET PUMPS
JET MIXERS
JET REACTORS
JET ABSORBERS
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SPECIAL JET VENTURI UNITS

During the first several years of the forty-two year history of our firm, we specialized entirely on steam jet vacuum pumps (ejectors). Many thousands of these are in service throughout the country and in most foreign countries. Our tradename, EVACTOR, is an important word in engineering circles. While steam jet vacuum pumps are still our major item, other applications of Jet-Venturi equipment are increasing constantly. With the exception of closely related products such as barometric condensers, CHILL-VACTORS, and CONVACTOR* systems, all of our activity is directed to the one purpose of making Jet-Venturi units more efficient, more dependable, more economical, and to apply them to an increasing number of industrial applications.

* The CONVACTOR is a dual condensing system for economic and efficient recovery of high boiling components from water vapor.

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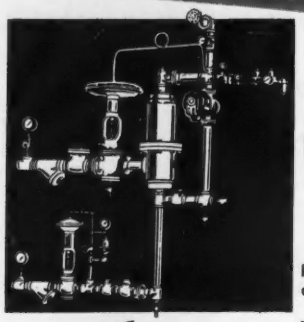
CUT HOT WATER COSTS



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Hot water in a flash — produced only as it's needed!

Pick patented mixing chamber is completely automatic . . . direct contact of steam and water provides desired hot water temperature *instantaneously* . . . temperature accurately maintained by thermostatic controls.

Water volume adjustable from 5% to full rated capacity of heater. 20-second reaction to desired up-and-down changes in water temperature.

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FREE BULLETIN Shows how Pick Heaters are used in many industries.

Pick WATER HEATERS

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For faster, easier connection of spray nozzles, branch lines and equipment to piping and tubing carrying liquids, gases or air up to 250 psi. Write for Bulletin 93.

FOR BETTER PERFORMANCE

SPRAY NOZZLE ACCESSORIES

ADJUSTABLE JOINTS

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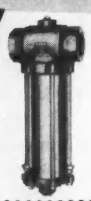
Special non-collapsing screen design for pressures up to 125 psi, for all pipe lines from ¼" to 6" size. Also high pressure strainers for up to 5,000 psi service. Write for Bulletin 94.



FOR COMPLETE SPRAY NOZZLE INFORMATION WRITE FOR CATALOG 24

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technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Items followed by (†) indicate literature offered by advertisers. Key numbers in the last line will help locate these reviews, which are numbered in sequence.

Processing Equipment, Accessories

Presents data on organic heat-transfer fluids and how to pump them*, 9 pp, (Tech Bul No. 6) Fostoria Corp., Chempump Div.
7566 on Reader Service Slip.

Split-case centrifugal pumps can handle many liquids up to 300F*, 18 pp. (Bul B-1300) Food Machinery, Peerless Pump Div.
7579 on Reader Service Slip.

Cutter to remove corn from the cob delivers up to 1/3 more corn*, 16-page bul., The United Co.
7589 on Reader Service Slip.

Polyester plates and frames for filter presses*, 2 pp, (Bul No. 149) T. Shriver & Co., Inc.
7575 on Reader Service Slip.

Carbon dioxide and its uses*, 24 pp, Pure Carbonic Co.
7580 on Reader Service Slip.

Complete spray dryer lab facilities described and illustrated*, 4 pp, (Bul No. 239) Nichols Engineering
7583 on Reader Service Slip.

How pressure feeding into screw press increases capacity of press*, 2 pp, (Bul P-33) Bauer Bros.
7565 on Reader Service Slip.

Easy-to-clean food pump pumps suspended solids without product breakdown†, (Bul 34FP) Robbins & Myers, Inc.
7611 on Reader Service Slip.

"How Carbon Dioxide Serves You"†, 24 pp, (Bulletin) Pure Carbonic Co.
7612 on Reader Service Slip.

Describes line of processing equipment including evaporators, vacuum rotary dryers, drum dryers, filters, etc.†, (Cat) Goslin-Birmingham
7613 on Reader Service Slip.

Dewaters any material with free moisture continuously, 4 pp, (Brochure) P & L Manufacturing Co., Inc.
7614 on Reader Service Slip.

Corrosion-resistant processing equipment†, (Bulletins) Lee Metal Products Co.
7615 on Reader Service Slip.

Case history on continuous centrifuging†, (Bul 946) Pfaudler Permutit
7616 on Reader Service Slip.

Case history of packaged processing system for crushing, mixing, grinding, sifting and pneumatic conveying†, (Bul F-19) Sprout-Waldron
7617 on Reader Service Slip.

Porous stainless steel pipe-line filters, 4 pp, (Release M-213A) Micro Metallic Div. of Pall Corporation
7618 on Reader Service Slip.

Selection guide for line of permanent magnetic pulleys, 6 pp, (Cat B-50-1A) Eriez Mfg.
7619 on Reader Service Slip.

Corrosion-resistant vacuum water filters, 4 pp, (Bul 1860.20-2) B-I-F Industries
7620 on Reader Service Slip.

Up to 13,200 gph water demineralizers, 4 pp, (Bul 5819) Cochrane Corp.
7621 on Reader Service Slip.

Continuous spray or conveyor drying equipment, 4 pp, (Bul 447) Proctor & Schwartz, Inc.
7622 on Reader Service Slip.

Processing equipment of tantalum, titanium and zirconium, 8 pp, (Bul 978) Pfaudler Co.
7623 on Reader Service Slip.

Complete line of processing equipment for meat and other food industries, 68 pp, (Cat No. 960) C. Schmidt Co.
7624 on Reader Service Slip.

Ingredients, Food Additives

Using improved sorbic acid as a food preservative*, 16 pp, (Bul F8256-B) Union Carbide Chemicals
7480 on Reader Service Slip.

The advantages of using milk

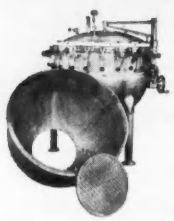
SA—streamlined balloon jacket design. Extra large diameter provides greater heating surface. Sizes 15 to 500 gallons. Constructed for steam working pressures of 40, 90 and 125 pounds.

SA MIX COOKER—has single or double motion agitator with or without hydraulic lift. Agitator lifts easily and smoothly out of cooker. Sizes 30 to 500 gallons.

CW—designed to process batches up to 150 gallons. Positive worm gear. Handwheel gives control of capacity loads while tilting. Large diameter kettle gives fast even cooking.

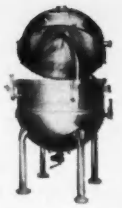
BUILT-IN QUALITY

. . . IN HAMILTON SPECIAL OR STANDARD KETTLES ASSURES LOWER PROCESSING COSTS



PC—stainless steel pressure cooking kettle for meat and poultry processing. 90 p.s.i. in jacket and 15 p.s.i. in kettle. Quick opening latches. Top is lifted by eccentric lever. Sizes 30 to 250 gallons.

HV—vacuum cooker from 150 to 500 gallons. Hinged manhole provides access to the inside. Available with a mixer—circulator can be installed to increase heat transfer and agitation.



VT—vacuum cooker has no equal for small batches. Tilting top easy loading. Sizes 30 to 150 gallons. Jacketed for 90 p.s.i. steam working pressure.

SPECIAL—PC Style Pressure type mix-cooker. Jacket to full 200 gal. level. Plate type heating-cooking coils arranged to act as agitator baffle plates. Entire unit removable for easy cleaning.

Hamilton offers the right kettle for any mixing or cooking job. The Cost? Reasonable and economical in the light of finished and polished fabrication. Sanitation guaranteed. Careful competent workmanship and constant inspection assures you of quality that is built-in. We'll work from your prints or create them for you on our drawing boards. Write for free Hamilton Kettle Catalogue.

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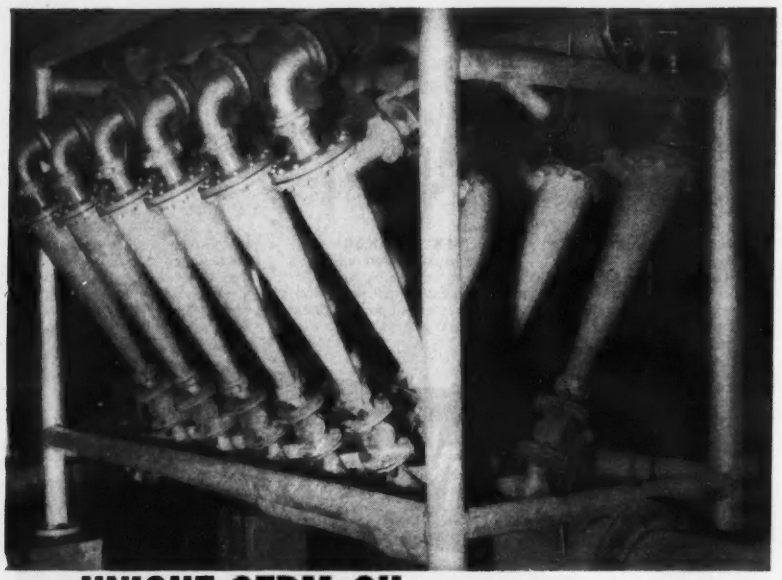

UNIQUE GERM-OIL SEPARATION SYSTEM USES MOLDED PLASTIC DorrClones *at Union Starch and Refining Co., Inc.*

A complete germ-oil separation system – the first of its kind – processes 1100 gpm of steeped corn slurry at the corn wet milling plant of Union Starch and Refining Company, Inc., Granite City, Ill.

The unique feature of the installation is its use of DorrClone wet cyclone separators made of molded plastic. The system comprises 18 6" dia. DorrClones, arranged for 2-stage separation. Overflow from the first stage of 12 units (shown above) is recycled to the second stage of 6 units, giving maximum germ-oil recovery.

Plastic construction makes possible sanitary, low cost equipment. Only the headers are of expensive stainless steel. Added to this are the basic advantages of wet cyclone operation – efficient separation by centrifugal force, no moving parts, ease of control and continuous, high capacity processing with the minimum of attention. Wide opportunities exist for other cost-saving applications of molded plastic DorrClones throughout the food processing industry. For further information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

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new literature

sugar in your products*, 30 pp, Western Condensing
7472 on Reader Service Slip.

"A New and Improved Replacement for Beef Extract"*, 2-pg Bul, Vico Products Co.
7475 on Reader Service Slip.

Nutrients in foods†, (Booklet on "Merck Research for the Food Industry"), Merck Chemical Div.
7627 on Reader Service Slip.

The use of milk sugar in food products†, (Bulletins and samples) Western Condensing
7628 on Reader Service Slip.

What sodium and calcium caseinates can do to improve product quality†, (Technical data and samples) Sheffield Chemical
7629 on Reader Service Slip.

Price list of certified colors, 4 pp, (List #C-L) Pylam Products
7630 on Reader Service Slip.

Packaging, Labeling, Cartoning

Complete line of bag closing equipment†, (Cat) Dave Fischbein Co.
7631 on Reader Service Slip.

Using inert gas for packaging foods†, (4 Bulletins: "New Opportunities for More Profitable Packaging"; "Facts on Gases Used for Food Products"; "Technical Information — Gas Propellants for Pressurized Packaging of Foods and Other Products"; and "Nitrous Oxide and 'Freon C318' — as Propellants for Aerosol Food Products") Air Reduction Co.
7632 on Reader Service Slip.

New Jar-inverting and cleaning line, 2 pp, (Bul 1493) Chisholm-Ryder Co. of Pa.
7633 on Reader Service Slip.

New model air-return, no-recoil Paslode stapler, 4 pp, (Bul PRI-4597) Signode Steel Strapping
7634 on Reader Service Slip.

New automatic unit to fill and seal all plastic tubes, 2 pp, (Bul 16) Carbert Mfg. Co.
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Line of air-cleaning machines for bottling lines, 8 pp, (Bul 141) Pneumatic Scale.
7636 on Reader Service Slip.

All-purpose, 16-head rotary liquid filling machine, 2 pp, (Bul 142) Pneumatic Scale
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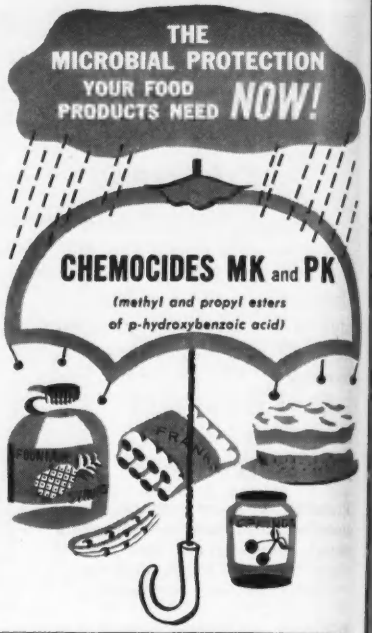
Carbert unscrambling-feeding machine for bottles to 4-in. in diam, 2 pp, (Bul 143) Pneumatic Scale
7638 on Reader Service Slip.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(methyl and propyl esters of p-hydroxybenzoic acid)

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- Effective in acid, neutral and alkaline pH ranges
- More active against molds, yeast and bacteria
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18-head rotary-inverted air cleaner, 2 pp, (Bul 144) Pneumatic Scale
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Automatic feeder for various sizes of plastic containers, 2 pp, (Bul 147) Pneumatic Scale
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Atkron-Dumore automatic four-flap case opener, 4 pp, (Bul FF-600) Geo. J. Meyer Mfg.
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Effect of Poultry Products Inspection Act on wrapping, handling, labeling, 4 pp, Riegel Paper Corp.
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Line of marking, dating, coding and imprinting machines, 8 pp, Industrial Marking Equipment
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Line of automatic film packaging machines, 4 pp, General Packaging Equipment Co.
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Proper carton sealing with kraft sealing tapes, 4 pp, Minnesota Mining & Mfg. Co.
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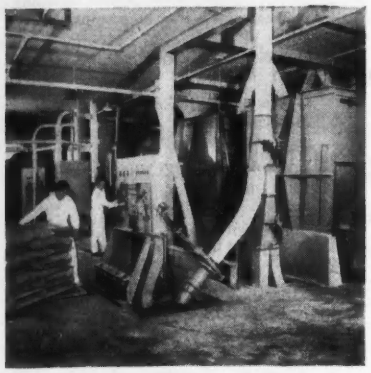
Proper carton sealing with reinforced tapes, 4 pp, Minnesota Mining & Mfg. Co.
7650 on Reader Service Slip.

Bulk Handling, Accessories

Permaglass storage structures†, (Bul MU-107) A. O. Smith Corporation, Harvestore Products Division,
7651 on Reader Service Slip.

Problem:

To boost starch and gum production while cutting operating costs



Solution:

SPROUT-WALDRON
UNIT MACHINES AND SYSTEMS

When Morningstar Paisley executives decided to move activities to their new plant at Hawthorne, N. J., they demanded a system meeting these specifications: extreme versatility, no dust nuisance, protection against contamination, low handling and operating costs, stepped up capacity.

The answer was found in a packaged processing system involving Sprout-Waldron machinery for crushing, mixing, grinding and sifting; plus a series of four negative pressure pneumatic conveying systems.

Blending and bagging of starch, gum grinding and gum granulation are now being accomplished with a minimum of handling and maximum of efficiency. Operating costs are down, capacity up. For the full story ask for Bulletin F-19.

CW/107

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Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
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"He's okay . . . his pants got caught for a minute in the bag filler."

residue analysis...

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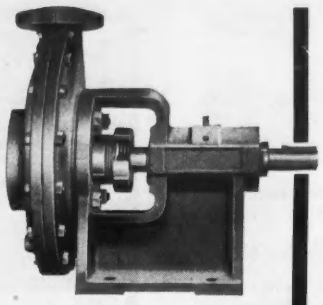

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and abrasive slurries!

Will not affect taste or color.

Will not introduce impurities into the material being pumped.

Eight sizes available from stock through your Ampco Pump Distributor.

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P-44

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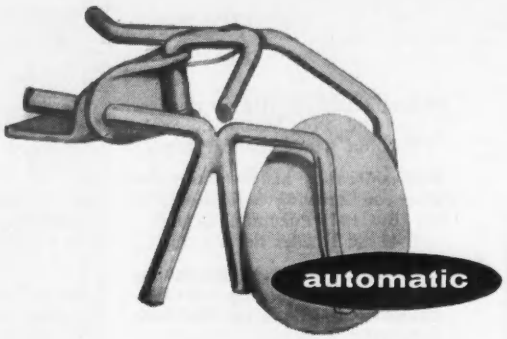

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a better product at a lower cost

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With average breaking stock, the Seymour will give you 80-90 percent clean yolk separation, lower yolk fat content in whites and more uniform yolk coloring.

It breaks at a speed of 18 cases an hour using only two operators. Eggs are never touched by hands.

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Always Depend On

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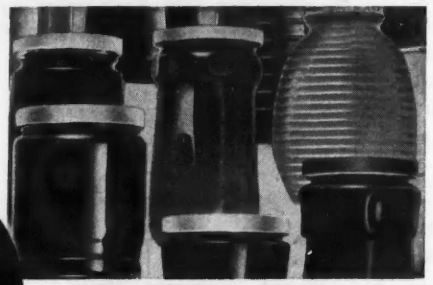

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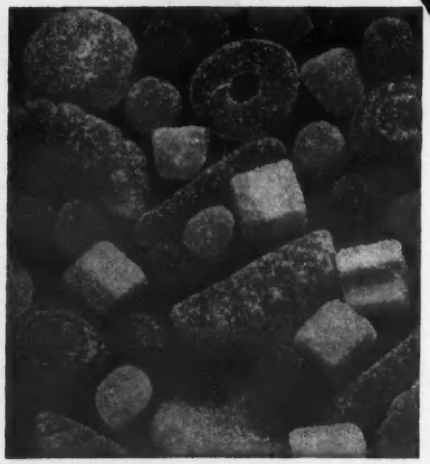
Regular and Slow Set
For Finest Jams, Jellies and Preserves



- Adaptable to wide range of PH levels.
- Neutral color and flavor—blends naturally with more different fruits than any other pectin.
- Gives product resiliency to avoid breakage during shipping.
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Write, wire or phone for full information, technical advice, or location of nearest warehouse.

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new literature

Continuous bucket elevator bulk handling equipment†, (Bul 912) Meyer Machine Co.
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Faster grain and feed handling with automatic equipment, 4 pp, (Bul 1159) Prater Pulverizer Co.
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Conveyors, Racks, Accessories

Engineered conveyor products for food handling systems†, (3 Bulletins: S-A Redler Conveyor-Elevators, Bul 358; S-A Continuous Weigher, Bul 958; and S-A "Zipper" Closed-Belt Conveyor-Elevator, Bul 349) Stephens-Adamson
7658 on Reader Service Slip.

Metal process conveying belts†, 130-page reference manual, The Cambridge Wire Cloth Co.
7659 on Reader Service Slip.

Specially treated conveyor belts for resistance to specific products†, (Free Manual) Buffalo Weaving
7660 on Reader Service Slip.

Metal process belts for conveying products†, (Technical Lit) Ashworth Bros.
7661 on Reader Service Slip.

Technical data on and typical applications for wheel conveyors, 4 pp, (Cat 750-C) Samuel Olson Mfg. Co.
7662 on Reader Service Slip.

Fork Trucks, Accessories

Quick way to estimate lift truck costs*, 12 pp, Lead Industries Assn.
7522 on Reader Service Slip.

7000-lb capacity gasoline powered lift truck, 4 pp, (Bul 1375-B) Baker Industrial Trucks
7663 on Reader Service Slip.

5000-lb capacity gasoline powered lift trucks, 4 pp, (Bul 1373-C) Baker Industrial Trucks
7664 on Reader Service Slip.

4000-lb capacity gasoline powered lift trucks, 4 pp, (Bul 1382-B) Baker Industrial Trucks
7665 on Reader Service Slip.

Heavy-duty 3000-lb capacity gasoline powered lift trucks, 4 pp, (Bul 1397) Baker Industrial Trucks
7666 on Reader Service Slip.

3000-lb capacity gasoline-powered lift trucks, 4 pp, (Bul 1371-A) Baker Industrial Trucks
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How to use, install charge control unit for motive power charging, 6 pp, (Bul 5092) Exide
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Bauer
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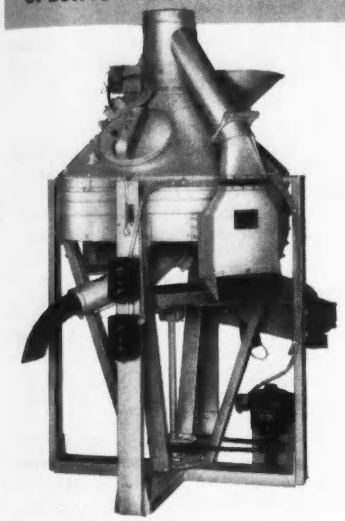

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No friction errors in liquid level gauge*, 4 pp, (Bul CP 3705) The Vapor Recovery Systems Co.
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For connecting thermocouples and their extension wires quickly*, 4 pp, (Spec Sheet FS005-3) Minneapolis-Honeywell Regulator Co. Industrial Div.
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Reports on automatic weighing†, (4 Bulletins: Automatic Batching, Bul 2964; Checkweighs In-Motion, Bul 2968; Load Cell Dial Does Triple Duty, Bul 2970; and Automates Drum-Filling, Bul 9030) Toledo Scale Co.
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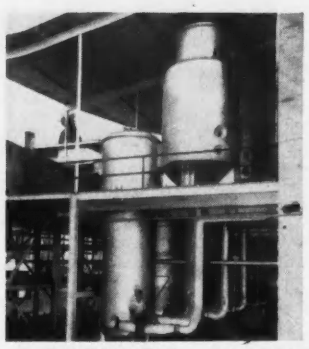

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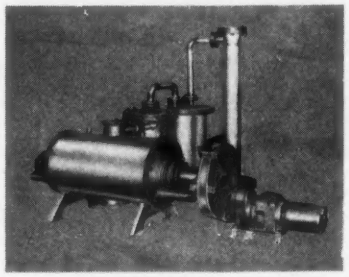

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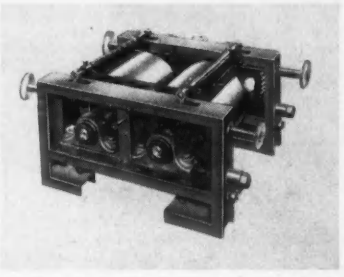

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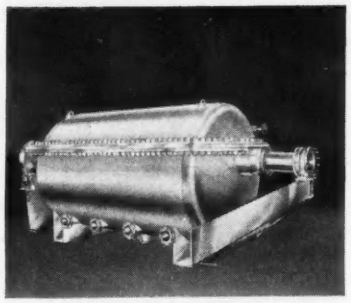

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ADVERTISERS
in this issue

A

Air Reduction Company, Inc., Customer Service Packaging Laboratory 89
Allis Chalmers, Industrial Equipment Division 113
American Maize-Products Company 22-23
Ampco Metal, Inc. 118
Ashworth Bros., Inc. 18

B

Bartelt Engineering Company 60
Bauer Bros. Co., The 119
Blaw-Knox, Buflovak Equipment Division 95
Bliss Company, E. W. 68
Boiler Division, Cleaver-Brooks Company 9
Bowser, Inc., Potter-Bowser Division 83
Buffalo Weaving and Belting Co., Inc. 39
Bzura Chemical Company Inc. 28

C

Cambridge Wire Cloth Co., The 77
Chain Belt Company 96
Chemo Puro Subsidiary of Century Chemical Corporation 116
Cleaver-Brooks Company, Boiler Division 9
Clupak, Inc. 63
Connecticut Hard Rubber Co. 72
Container Corporation of America 3rd Cover
Corn Products Sales Company 41
Croll-Reynolds Co., Inc. 114
Crown Zellerbach Corporation, Gaylord Container Division 59

D

Day Company, The 23
Day Co., The J. H., Division of The Cleveland Automatic Machine Co. 45
Delavan Manufacturing Company 78
Dempster Brothers Inc. 80
Diamond Crystal Salt Co. 46
Dorr-Oliver Incorporated 116
Durant Manufacturing Co. 64
Durkee Technical Service 10

E

Eastern Stainless Steel 104
Elwell-Parker Electric Company, The 78
Essex Conveyors, Inc. 27

F

Fairbanks, Morse, Scale Division 82
Fischbein Co., Dave 62
Fiske Brothers Refining Co., Lubriplate Division 112
Flavorex Co., Inc. 52
Florasynth Laboratories, Inc. 122
Flo-Tronics, Inc. 11
Food Machinery and Chemical Corporation, Canning Machinery Division 93
Foxboro Company, The 85
Fritzsche Brothers, Inc. 40
Fuller Company, Subsidiary of General American Transportation Corporation 70

G

Gardner-Denver Company 98, 99
Garlock, Inc. 106-107
Gas Atmospheres, Inc. 110
Gates Rubber Company, The, Sales Division, Inc. 74
Gaylord Container Division, Crown Zellerbach Corporation 59
General American Transportation Corporation, Louisville Process Equipment Division 94
General Chemical Division, Allied Chemical Corporation 24
Girdler Process Equipment Division, Chemetron Corporation 97
Givaudan Flavors, Inc. 39
Goslin-Birmingham Manufacturing Co., Inc. 119
Gray Company, Inc. 62
Groen Mfg. Co. 8

H

Hamilton Copper and Brass Works, Division of Brighton Corp. 115
Hertz Truck Lease 79
Holz Rubber Company, Inc. 72
Hotel Pittsburgher 62
Hyster Company, Industrial Truck Division 3

I

IBM 90-91
Ingersoll-Rand 109
International Salt Company 20

J

Johns-Manville 88

K

King Company of Owatonna 122
Klenzade Products, Inc. 105
Knox Glass, Inc. 55
Koch Supplies Inc. 58
Kraft Foods Industrial Division 49

L

Ladish Co., Tri-Clover Division 12
Lake States Yeast and Chemical Division of St. Regis Paper Company 48
Lammert & Mann Co., Inc. 78
Land O'Lakes Creameries, Inc. 7
Langsenkamp Co., F. H. 62
La Porte Mat & Mfg. Co. 74
Lee Metal Products Company, Inc. 19

(*Continued on next page*)

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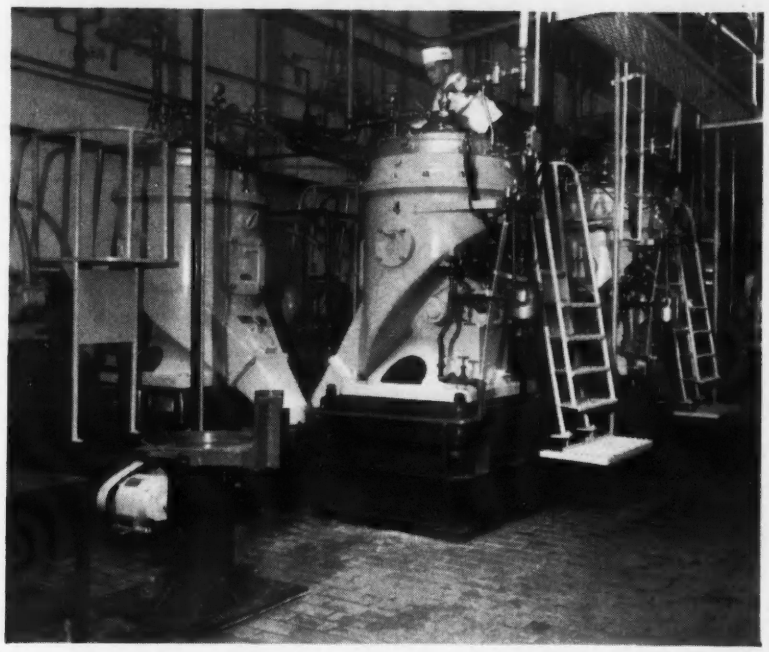

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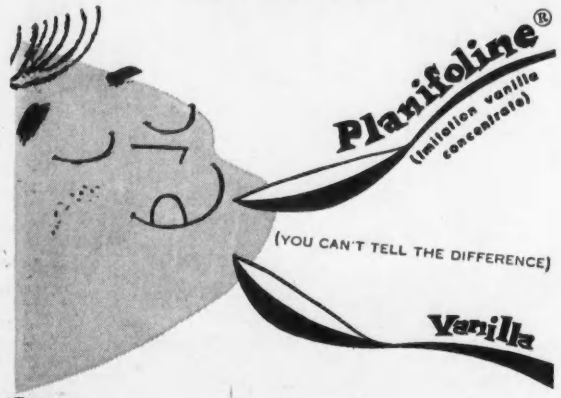

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(Continued from preceding page)

Louisville Process Equipment Division General American Transporation Corporation 94
Lubriplate Division, Fiske Brothers Refining Co. 112
Lumenite Electronic Company 81

M

Marschall Dairy Laboratory, Inc. 18
Merck & Co., Inc., Merck Chemical Division 50-51
Meyer Machine Company 72
Miles Chemical Company, division of Miles Laboratories, Inc. 13
Minnesota Mining and Manufacturing Company 54
Mixing Equipment Co., Inc. 92
Morton Salt Company, Industrial Division 43

N

National Starch and Chemical Corporation 21
Neptune Meter Company, Liquid Meter Division 84
Niagara Blower Company 27
Norda ..... 2nd Cover
Nukem Products Corp., A Subsidiary of Amercoat Corp. 108

O

Olin Mathieson Chemical Corp., Packaging Division 69

P

Pfaudler Permutit Inc., Pfaudler Division 64, 121
Pick Mfg. Co. 114
Pittsburgh Corning Corporation 111
Pneumatic Scale Corp., Ltd. 65
Pressed Steel Tank Company 58
Pure Carbonic Company, A Division of Air Reduction Company, Incorporated 86
Putman Publishing Company 42, 58, 112

R

Reliance Electric and Engineering Co. 71
Reynolds Metals Company 57
Robbins & Myers, Inc. 14
Rohm & Haas Company 100, 101

S

Sandvik Steel, Inc. 65
Seymour Foods, Inc. 118
Sheffield Chemical, A Division of National Dairy Products Corporation 4
Simplicity Engineering Company 25
Smith Corporation, A. O., Harvestore Products Division 75
Speas Company 118
Spraying Systems Co. 114
Sprout-Waldron 117
Staley Mfg. Co., A. E. 17, 52
Steelcote Mfg. Co. 110
Stephens-Adamson Mfg. Co., Engineering Division 6
Strataflo Products, Inc. 58
Strong Scott Mfg. Co., The 76
Sunkist Growers, Products Sales Dept. ..... 4th Cover

T

Taylor Instrument Companies 102-103
Thomsen & Sons, Inc., L. C. 60
Toledo Scale, Division of Toledo Scale Corporation 61

U

U. S. Stoneware, Plastics and Synthetics Division 26
Upco Co., The 105
Urschel Laboratories, Inc. 56

V

Victor Balata & Textile Belting Co. 73

W

Warner-Jenkinson Manufacturing Co. .. 15
Warrick Co., Charles F. 81
Western Condensing Company 47
Wisconsin Alumni Research Foundation 117

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7418	7465	7512	7559	7606	7653
7419	7466	7513	7560	7607	7654
7420*	7467	7514	7561	7608	7655
7421	7468	7515	7562	7609	7656
7422	7469	7516	7563	7610*	7657
7423	7470	7517	7564	7611	7658
7424	7471	7518	7565	7612	7659
7425	7472	7519	7566	7613	7660
7426	7473	7520	7567	7614	7661
7427	7474*	7521	7568	7615	7662
7428	7475	7522	7569	7616	7663
7429	7476	7523	7570	7617	7664
7430	7477	7524	7571	7618	7665
7431	7478	7525	7572	7619	7666
7432	7479	7526	7573	7620	7667
7433	7480	7527*	7574	7621	7668
7434	7481	7528*	7575	7622	7669
7435	7482*	7529	7576	7623	7670
7436	7483	7530	7577	7624	7671
7437	7484	7531	7578	7625	7672
7438	7485	7532	7579	7626	7673
7439	7486	7533	7580	7627	7674
7440*	7487	7534	7581	7628	7675
7441	7488	7535	7582	7629	7676
7442	7489	7536	7583	7630	7677
7443	7490	7537	7584	7631	7678
7444	7491	7538	7585	7632	7679
7445	7492	7539	7586	7633	7680
7446	7493	7540	7587	7634	7681
7447*	7494	7541	7588	7635	7682
7448*	7495	7542	7589	7636	7683
7449*	7496	7543	7590	7637	7684
7450*	7497	7544*	7591	7638	7685
7451*	7498	7545	7592	7639	7686
7452*	7499	7546	7593	7640	7687
7453*	7500*	7547	7594	7641	7688
7454*	7501	7548	7595	7642	7689
7455*	7502	7549	7596	7643	7690
7456*	7503	7550	7597	7644	Back
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7459	7506	7553	7600	7647	
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No. of Employees or Capital Rating _____

Street Address of Company _____

City _____ Zone No. _____ State _____

CHANGE OF ADDRESS . . . Use this form to notify us of a change in address. Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

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No. of Employees or Capital Rating _____

Street Address of Company _____

City _____ Zone No. _____ State _____

* "substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

that's interesting

Protein power

Despite the muscle - flexing of their top athletes and the missile -launching of their top scientists, the Russian people lag behind Americans when it comes to food.

Carl F. Neumann of the National Live Stock and Meat Board, noted that in Russia and in the US per capita consumption of protein is identical — 88 grams per day.

However, 57 per cent of the protein in the American diet is "high - quality, complete protein" from animal sources, while only 19 per cent of Ivan's daily intake of protein comes from animal sources.

Averages schmaverages

Averages may not mean much as far as the human body is concerned, judging from caloric-intake studies made at King's College Hospital, London.

It was found that the daily caloric intake of 63 men of the same age and economic group varied from 1730 to 5475 calories per day. A similar study on women showed a range of between 1172 and 3202 calories.

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